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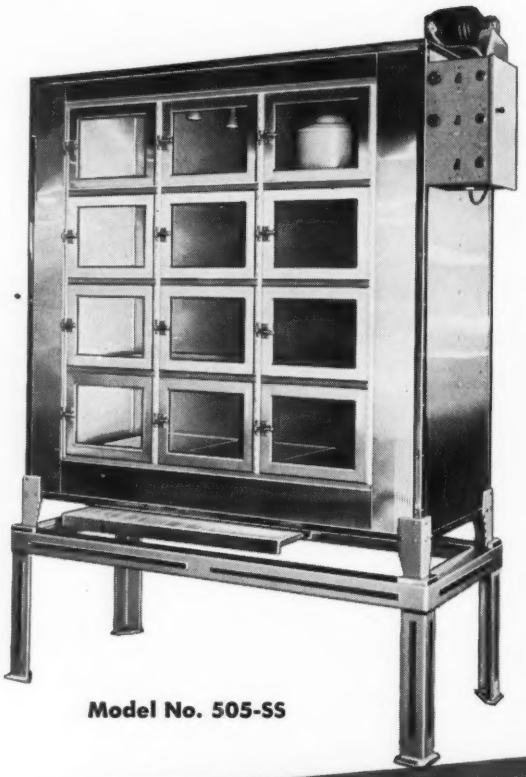

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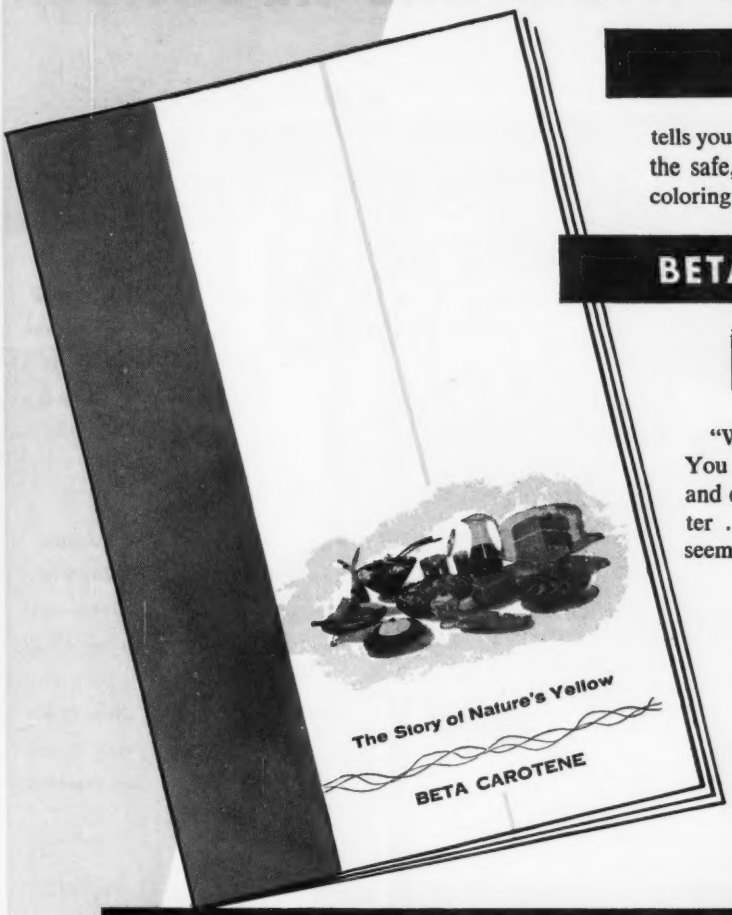

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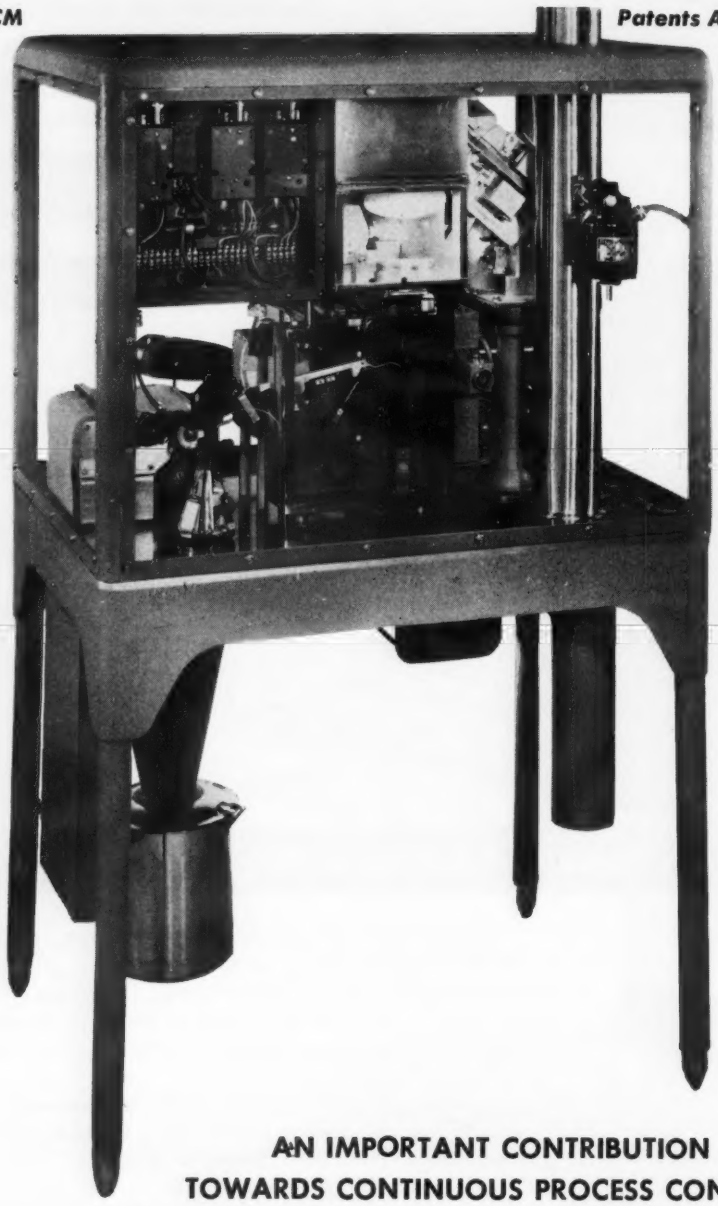

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LETTERS to the editor

INSECT INFESTATION OF GRAIN

DEAR SIR:

I read with interest Kenton L. Harris' informative article about insect infestation of grain in the January issue of CEREAL SCIENCE TODAY and I am in agreement with his findings that the X-ray inspection technique is the best means for measuring internal infestation of wheat.

I would like to make a correction in Table IV of this article. Since the figures given in the first column of the table are actually a tabulation of the results of the control method, it should read "Number per 100 grams" not "Average per 100 grams." In addition, the first three totals represented on this table are in error. Corrected, they read 1072, 225.2, and 1408.6 respectively. Thus the ratio of the total number of insects found by cracking flotation to the total average number of kernels with exit holes found by visual examination is about 5 to 1. The ratio of the total number of insects found by cracking flotation to the total average number of damaged kernels found by X-ray is about 3 to 4. This is in accordance with the author's statement that the X-ray procedure is directly related to the cracking flotation method used in the 1950-51 wheat survey.

THEODORE F. SCHWANDT, JR.

AUTHOR'S REPLY

DEAR SIR:

I appreciate Mr. Schwandt's taking the time to write concerning the apparent discrepancies in Table IV of my article in the January 1958 issue of CEREAL SCIENCE TODAY. Table IV, as indicated in the parenthesis that forms part of the heading, is summarized from Nicholson *et al.* (J. Assoc. Offic. Agr. Chemists *36:* 138; 1953). Thus, although the subheading to column 1, "av/100 g", is not entirely accurate, each figure in this column does represent more than one result. For example, there were three samples counting 0, ten counting 1, ten counting 2, seven counting 3, etc. With these multiple results from the original work taken into account, the total of the first column is 2485, not the 545 reported by me (which was an error in transposing columns from the earlier work) or the 1072 as suggested by him.

The second column total is in fact 556. This figure cannot be obtained from the data in the CEREAL SCIENCE TODAY article, but must be obtained from the original paper. The same is true for the 3761 in the third column.

This explanation covers the calculations made by Mr. Schwandt.

KENTON L. HARRIS

Food and Drug Administration
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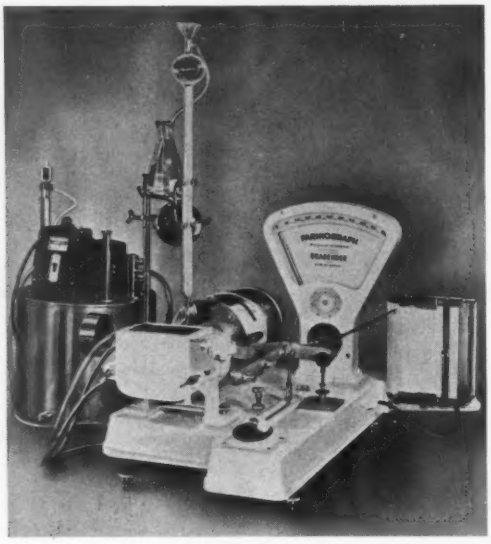

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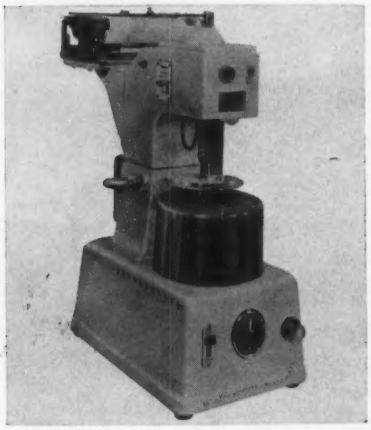

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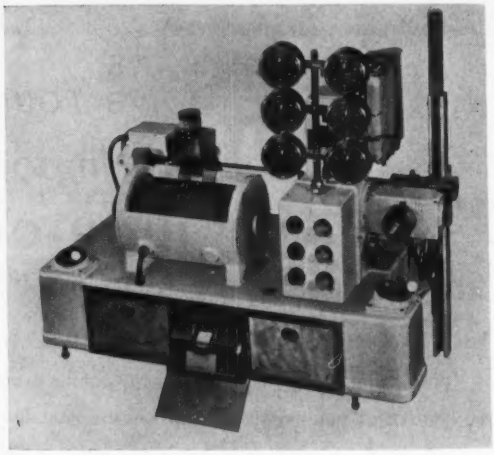

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Editorial

THE PRESENT NATIONAL emphasis on scientific training should focus attention on scientific meetings because of their importance in the continual effort required by scientists to keep abreast of developments in their own fields.

AACC annual meetings do not differ from other scientific meetings except that they are directed to the interest of scientists employed in the field of cereals. Cereal chemistry, although less directly concerned with national preparedness than atomic physics, electronics, and engineering, deserves its share of the present interest in science. Increased knowledge of cereals is required to keep pace with the ever-growing world demand for food, particularly in time of emergencies, when cereal foods tend to assume their rightful place in nutrition even in the American economy.

Cereal chemists who attend the 43rd annual meeting in Cincinnati will obtain the benefit of the research reported by the program participants several months before the more formal presentations of research can be published in CEREAL CHEMISTRY. Many of the reports involve problems of immediate concern to each of us; all broaden our horizon to improve our qualifications as scientists whose interests should not be limited to our own personal activities.

The annual meeting also gives members an opportunity to determine the management of their association. At the business meeting one may express his opinion on association affairs and cast his vote on important matters brought before the membership by the Board of Directors.

On April 9th, you will be asked to vote on certain issues of importance to your association. It was only after three years' study of alternative means of increasing AACC income, by the Executive Committee and later the Board of Directors, that it was decided to ask the members for permission to increase dues. Inflation has shrunk the value of AACC's dollars just as it has the dollars of its members. Growth of the organization has made necessary the hiring of personnel to perform duties, once so limited that they could be done gratis by your officers. The combination of these two factors has increased the cost of operation beyond the income provided by dues, subscriptions, and advertising revenue.

We hope each of you may avail himself of the opportunities offered by the annual meeting, and look forward to seeing you in Cincinnati, April 7 to 11, 1958.

WILLIAM B. BRADLEY

A PROMINENT NUTRITIONIST ASKS

Bread—for Man or Rats?

By William B. Bradley, Scientific Director, American Institute of Baking, Chicago

As knowledge of nutrition increases, food processors have had difficulty finding their way through the maze of established fact, unproven theory, and conflicting claims. This confusion has led to the marketing of many bizarre products which have proved themselves the answer to the hucksters' prayers.

Fortunately or unfortunately, bread can be made the carrier of many unique ingredients and of all purified nutrients except vitamin C. This is fortunate, should it ever be necessary to produce a bread containing unusual quantities of individual nutrients. It is unfortunate because there are those who now look to bread as the vehicle for the newer contributions of our increased knowledge of nutrition, without regard to necessity or even desirability.

In an address before the members of the American Institute of Baking at its annual meeting in 1950, C. A. Elvehjem stated, "I cannot help but emphasize again that some of the nutritional studies carried out in which bread has been used as the sole article of diet for rats and the criticisms which have been made of certain types of bread because the rats failed to grow normally show lack of a thorough understanding of nutritional problems."

An obvious corollary to this statement is, "Nutritional studies in which bread of unique composition has been used as the sole article of diet for rats and the claims for superiority made for it because the rats grew at a rapid rate, show lack of a thorough understanding of nutritional problems."

I plan to point out some facts that establish the validity of this corollary, arguing that those who make such studies 1) fail to recognize that man does not live by bread alone, and 2) they overlook the differences in nutritional requirements of man and rats.

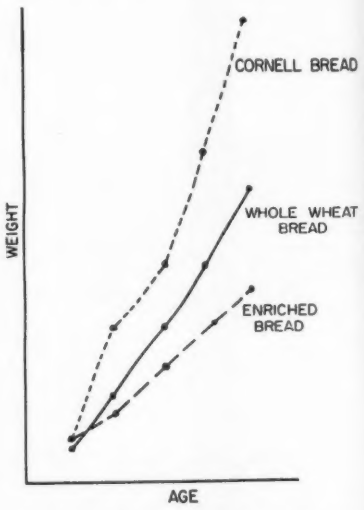
Since the introduction of bread enrichment, which returned to bread the thiamine, riboflavin, niacin, and iron lost with the use of white flour in breadmaking, most "nutritional improvement" of bread has been aimed at increasing the biological value of its protein. In 1915 Osborne and Mendel determined that wheat proteins did not carry the proper balance of amino acids to provide optimum growth of rats when fed as the sole source of protein. Lysine was found to be the most limiting of the amino acids.

EDITOR'S NOTE: *During the past year Dr. Bradley has delivered this paper before a number of AACC Local Sections. On several occasions the press has misinterpreted his remarks with the result that he has been often misquoted. As the reader will soon discover the author makes the following two points extremely clear: 1) He is definitely in favor of bread enrichment as the program is now being carried out; 2) He sets forth certain conditions which should be met* BEFORE *other enrichment practices are adopted.*

The Cornell Loaf

Shortly after World War II, Clive McCay of Cornell University developed a loaf which has become known as the Cornell loaf or (to the discomfiture of the Food and Drug Administration) "triple rich bread." Its formula requires unbleached flour, 6% full-fat soya flour, 8% nonfat dry milk, and 2% wheat germ.

When this bread is fed to young rats either as the sole food, or with butter, growth is much faster and health is much better than when commercially produced enriched bread makes up the diet. The differences in growth shown in the accompanying graph are considerable.



Growth of rats receiving bread as sole article of diet. (Source, see reference 1.)

However, man is not confined to a cage and required to subsist on a single food. Because of his ability to choose a variety of foodstuffs and because a varied diet appeals to him, he eats numerous foods. The combined contributions of these foods determine his nutrient intake. Thus the alteration of the nutritional contribution of a single food has significance only if its alteration results in converting a poor diet into a good one.

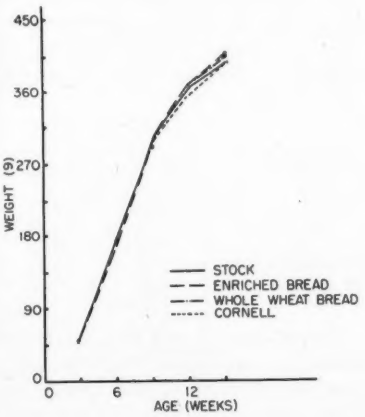
To determine whether the type of bread in the diet of the average person in this country might affect the adequacy of the diet, W. K. Calhoun of our laboratory repeated the experiments conducted at Cornell and

Rochester. However, instead of using Cornell bread, whole wheat bread, or enriched bread as the sole component of the diets, he included bread in the diet as it would be used by man.

The diet used was made up of forty foods selected from the various food groups and incorporated in the diet in proportion to their disappearance from the retail market in 1952. This selection of foods and determination of quantities used were based on Agricultural Handbook No. 62, "Consumption of Food in the United States, 1909–1952."

One diet contained enriched bread, the second whole-wheat bread, and the third Cornell bread. Dairy products, excluding butter, contributed 13.4% of the calories; eggs 2.8%; meat, poultry, and fish 12.8%; fats and oils 20.1%; legumes 2.9%; potatoes and sweet potatoes 2.9%; citrus fruits and tomatoes 1.4%; leafy, green, and yellow vegetables 1.2%; other vegetables and fruits 3.9%; sugar and syrups 15.4%; cocoa 0.4%; corn meal 2.5%; rice 0.7%; oatmeal 0.7%, and bread 18.9%.

Growth of these three groups of animals was identical (see graph) and also identical to the growth of animals on the stock diet. Average weights of the individual groups at each time interval were so close they can be depicted only by a single line.



Growth of rats consuming average American diet in which the type of bread was the only variable.

The nutritional status of the rats receiving Cornell bread was no better than that of the rats receiving whole-wheat bread. In turn, the nutritional status of the rats receiving whole-wheat bread was no better than that of the rats on enriched bread. Foods in the diet supplemented one another. No single food was required to furnish the needed nutrients.

It is recognized that the results of these experiments have limited application. However, they do serve to emphasize the fallacy of certain purchase specifications for bread for particular uses. Frequently Cornell bread is requested for use in the school lunch program, despite the requirement that the class A lunch furnish an 8-ounce glass of milk, 2 ounces of a high-protein food such as meat, eggs, or cheese, a vegetable, and two slices of bread.

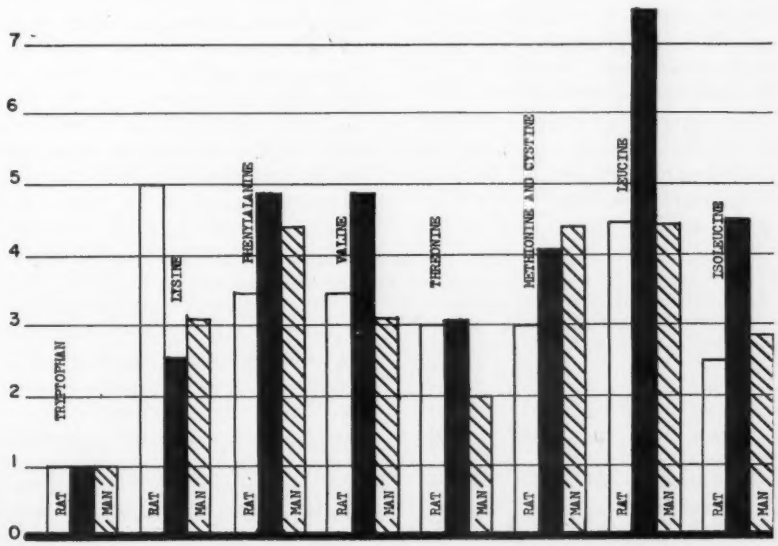
H. C. Sherman has demonstrated (4) that a mixture of one-third milk protein and two-thirds white flour protein provides maximum growth in young rats. The glass of milk in the school lunch provides sufficient milk protein to completely supplement the wheat protein in 8½ slices of enriched bread. Thus, the original supplementation of the wheat protein provided by the Cornell formula is unnecessary. It only adds to the cost of the lunch.

Man's Requirements

That man's requirement for nutrients may differ from that of rats is frequently overlooked. Nutritionists recognize the difference in requirements of the chicken and the turkey, the cow and the hog. When designing rations for barnyard animals, they adjust the composition of the ration to conform to the requirements of the species to be fed. When the addition of a nutrient to a turkey ration improves the rate of growth of turkeys, it is not necessarily added to a chick ration. It must first be established that the nutrient will improve the growth of chickens as well. Some of these same nutritionists, however, are prone to predict man's requirements on the basis of rat experiments.

The first bar graph shows the patterns of amino acid requirements of rat and man (see white and diagonal hatched bars) and the pattern of the amino acid content of average enriched bread (black bars). These patterns were developed by assigning tryptophan requirement or content the value of unity and stating the other amino acids in terms of the ratio of the actual requirement or content of them to the actual requirement or content of tryptophan. For example: man's minimum daily requirement for tryptophan is 0.25 gram, while his requirement for lysine is 0.8 gram. Thus he requires 3.2 times as much lysine as he does tryptophan. If tryptophan is assigned a value of 1, then lysine assumes the value of 3.2. Bread protein contains 0.97% tryptophan and 2.5% lysine. Thus bread protein furnishes 2.6 times as much lysine as tryptophan. If tryptophan is assigned the value of 1, lysine assumes the value of 2.6 in the

Pattern of amino acid requirements of man and rats and pattern of amino acid content of average enriched bread.



amino acid pattern. The amino acid pattern of man's requirement is based on data of Rose *et al.* (3) for amino acid requirements of adult man. The pattern for bread's contribution is based on the values published by Hepburn *et al.* (2). It can be readily seen that the lysine content of bread comes a long way from fitting the rat's pattern of requirement, but needs only a little boost to fit man's pattern of requirement.

The German Orphanage Study

From a practical standpoint, the differences in nutrient requirements for growing children and growing rats have been shown by McCance and Widdowson (5) in their study of the effect of extraction rate on the nutritive value of flour.

This study was made in 1947 and 1948 in two German orphanages. The subjects for the experiment were inmates whose ages ranged from 5 to 15 years. Because the Duisberg orphanage employed diets which were preponderantly bread, only this part of the study will be discussed.

The children at Duisberg were separated into five groups, care being taken to have each group as much like the others as possible in age distribution.

The purpose of the experiment was to determine the relative nutritive value for growing children of bread made from flours of different extraction or degree of enrichment. The flours employed in the experiment were 100% extraction (whole-wheat flour); 85% extraction; 70% extraction; 70% extraction enriched with thiamine, riboflavin, niacin, and iron to the 85% extraction levels; and 70% extraction enriched to whole-wheat levels. Analyses of the flours used are given in Table I.

All flours were fortified with Creta praeparata (calcium carbonate) at the following levels per 280-lb. sack: 100% extraction flour, 37 oz.; 85% extraction, 17 oz.; 70% extraction, enriched and unenriched, 10 oz. It should be noted that the rate of fortification with calcium was inversely proportional to the degree of purification of the flour. This was to compensate for the interference with calcium utilization caused by phytic acid, which is found in greatest quantity in whole wheat and in the lowest quantity in the 70% extraction flour. Despite this fortification with calcium carbonate, the 70% extraction flour used in these experiments produced bread which contained less calcium than the average commercial bread in the United States.

The children were maintained on these diets for 12 months. The foods employed in these studies are listed below, along with the average quantity served. The foods which are recognized in the United States as "protective foods" and those whose protein is given a superior rating were consumed in very small quantity. These were rationed foods in very short supply in Germany at the time this study was made. It should be noted that legumes (pulses) were not used to compensate for the dearth of animal foods.

Foodstuff	*Average consumption g/day*
Meat (cooked weight, including sausage)	6
Fish (cooked weight)	11
Cheese	7
Milk, fresh (mostly skimmed)	82
Butter and margarine	12
Jam	53
Sugar	5
Orange juice (concentrated)	20
Potatoes	168
Root vegetables	36
Green vegetables	63
Dried pulses (legumes)	2
Fruit (fresh and dried)	13
Semolina (for thickening soups)	34
Experimental flour	
100% extraction	447
or 85% extraction	437
or 70% extraction	418

Each child received daily a supplement which provided 2,000 IU of vitamin A, 1,000 IU of vitamin D, and 25 mg. of ascorbic acid. The second bar graph shows the protein sources in these diets. It should be noted that 73 to 79% of the protein came from wheat flour products of varying degrees of refinement. On the average, the amount of animal protein consumed was only 8 or 9 grams, making up 12 to 16% of the protein of the diet. The remainder of the protein came from vegetable sources other than wheat.

Clinical examinations were made at the beginning and at 3-month intervals throughout the experiment. Each child was given a clinical grading. Weight and height measurements were made at 2-week intervals. Serum proteins were determined; bone development was determined by X-ray of the left wrist and left elbow; intakes, absorptions, and excretions of nitrogen, calcium, phosphorus, magnesium, thiamine, riboflavin, and niacin were determined on a limited number of children.

What the Study Reveals

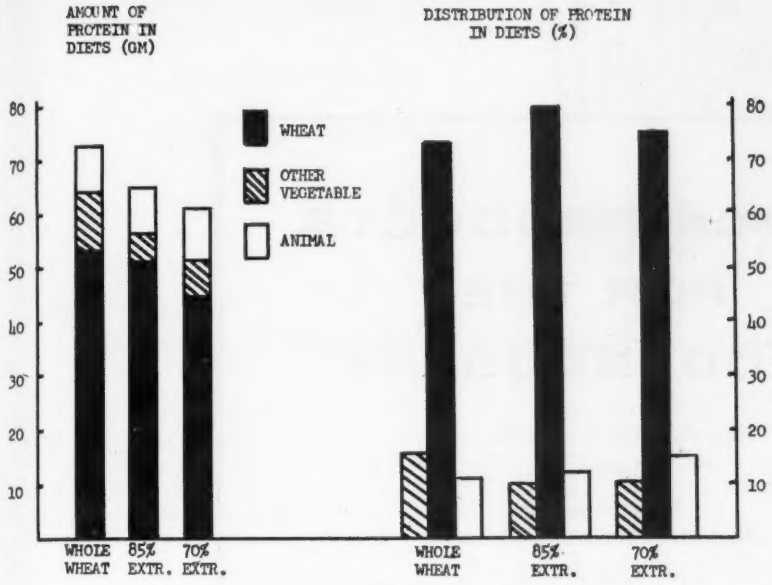
By all criteria used, the children did as well in one group as in another, and development in all groups surpassed expectation. Gains in height and weight are shown below, expressed as ratios to annual gains in height and weight of American children of the same age. It should be noted that the children developed almost 1½ times as much as American children of the same age do in the same length of time.

Extraction rate of flour %	*Height*	*Weight*
100	1.42	1.47
85	1.34	1.28
70	1.48	1.51
70 enriched to 100	1.47	1.55
70 enriched to 85	1.43	1.61

These data should not be interpreted as indicating that the diets were more nutritious than American diets. The performance of the children in this study surpassed the performance of American children of the same age because their physical development was suboptimal at the beginning of the experiment. Dietary deficiencies during and following the war accounted for this. However, it is inconceivable that they could have done so well had the diet been deficient in any nutrient.

TABLE I
COMPOSITION OF THE EXPERIMENTAL FLOURS

Extraction Rate of Flour	Moisture	Protein	Fat	Calcium	Iron	Thiamine	Riboflavin	Niacin
%	%	%	%	*mg/lb*	*mg/lb*	*mg/lb*	*mg/lb*	*mg/lb*
100	11.8	12.0	2.92	1710	20.5	1.87	0.69	22.8
85	12.2	11.8	2.77	880	13.0	1.55	0.37	13.2
70	12.4	10.9	1.90	497	7.8	0.68	0.21	8.7
70 enriched to 100% levels	12.4	10.9	1.90	497	19.2	1.87	0.45	25.5
70 enriched to 85% levels	13.1	10.9	1.90	497	12.2	1.55	0.32	15.5



Amount and distribution of protein in diets.

A subsequent experiment confirmed the adequacy of this diet for young growing children. After the conclusion of the experiment reported above, the children were re-formed into two groups. One group continued to receive the original diet. The second group was given a milk supplement (½ liter of milk) as a substitute for part of the bread. At the conclusion of the experiment 6 months later, the gain in height and weight of the two groups (Table II) was almost identical.

Certainly the diets used in these studies seemed to supply adequate nutrients for optimum growth of children. However, when they were fed to rats (final graph), less than optimum growth was obtained and definite performance differences were demonstrated. The best performance was less than optimum — further evidence of the differences between nutritional requirements of man and rat.

TABLE II

GROWTH IN HEIGHT AND WEIGHT DURING THE 6 MONTHS OF THE EXPERIMENT WITH MILK SUPPLEMENT

GROUP	AVERAGE AT BEGINNING	GAIN AS PERCENT OF STARTING POINT
Height (cm.)		
Milk		
Boys	131.4	2.4
Girls	131.7	2.6
All children	131.5	2.5
Control		
Boys	132.3	2.4
Girls	130.0	2.6
All children	131.1	2.5
Weight (kg.)		
Milk		
Boys	30.4	7.9
Girls	30.7	8.5
All children	30.5	8.2
Control		
Boys	30.1	8.0
Girls	30.5	8.2
All children	30.3	8.1

A Guide for Bread Enrichment

Growth of animals on an individual food should not be the guide to the development of nutritionally improved foods. Instead, the guide for determining the composition of a processed food such as bread could well be the principles which have served the Food and Nutrition Board in regard to the addition of specific nutrients to foods. These principles are:

1. "The Board, within carefully defined limitations, endorses the principle of the addition of specific nutrients to certain staple foods for the purpose of maintaining good nutrition as well as for correcting deficiencies in the diets of the general population or of significant segments of the population. The requirements for endorsement of the addition of a particular nutrient to a particular food include (a) clear indications of probable advantage from increased intake of the nutrient, (b) assurance that the food item concerned would be an effective vehicle of distribution for the nutrient to be added, and (c) evidence that such addition would not be prejudicial to the achievement of a diet good in other respects. These requirements have been met in the specific cases indicated in paragraph 6 below.

2. "The Board emphasizes the desirability of meeting the nutritional needs of the people by the use of natural foods as far as practicable, and to that end encourages education in the proper choice and preparation of foods and the betterment of food production, processing, storage, and distribution so as to provide more fully the essential nutrients native thereto.

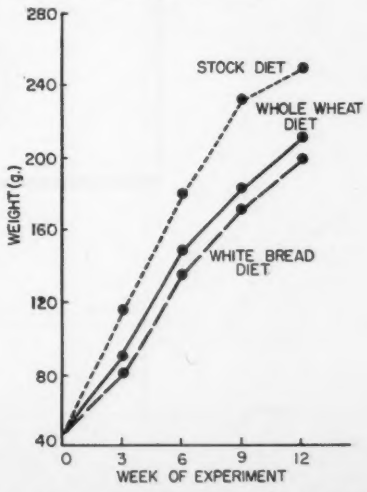
3. "In order to avoid undue artificiality of food supply, the Board favors, whenever practicable, the choice, as vehicles for the distribution of additional nutrients, of those foods which have suffered loss in refining or other processing, and recommends that the nutrients added to such foods should preferably be the kinds and quantities native to the class of foods involved.

4. "The addition of other than natural levels of nutrients to foods which are suitable vehicles of distribution may be favored when in the judgment of the Board the addition will be advantageous to the public health and when other methods for effecting the desired purpose appear to be less feasible.

5. "Whenever technological and economic developments lead to extensive reduction in the consumption of a staple food, with a consequent nutritionally significant reduction in the intake of an essential nutrient or nutrients, the Board believes that consideration should be given to the de-

(Please turn to page 97)

Average growth rates of male rats given the experimental diets from weaning.



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PRODUCTS OF THE CORN WET-MILLING INDUSTRY

Modified Corn Starches

By James W. Evans, American Maize-Products Company, Roby, Indiana

STARCHES HAVE BEEN the subject of many papers and talks in recent years, but the subject matter covers such a large area that only brief reviews have resulted. When efforts are made to discuss only a few of the many products available today, the information seems incomplete to individuals who work in the fields of carbohydrate chemistry and food technology.

In this discussion the same difficulties will prevail, but to a lesser degree, since only the newer modified starches will be discussed. Technology in modified starches is progressing very rapidly, and in many instances the rate is such that consuming industries are not kept informed. This presentation will attempt to cover both products which have been proved industrially and those which are in development stages; areas of greatest interest can then be selected for further discussion.

Special or modified corn and waxy maize starches are an important phase of the corn wet-milling industry which has grown rapidly in the past decade, and all evidence points to continued growth. Opportunities are the greatest here in imparting various properties to starches to make them more useful to industry and to the consumer. In the laboratories of the corn processing plants, consuming industries, universities, research institutions, and others, technically trained people are examining and working with modified starches and starch derivatives. Progress is not always rapid, but the technology is moving ahead. With the splendid attitude of all management in the corn wet-milling industry toward research and development, which has resulted in larger research-staffs and better equipment, progress will speed up. A great amount of assistance comes from those who either use or may use the starches—a very important relationship in any research and development program involving intermediate products.

As indicated earlier, only the more recently developed modified starches will be discussed. The classic types such as acid-modified thin-boiling, oxidized thin-boiling, and bleached starches, and the regular-line pyrodextrins and British gums will not be included. The terms "newer" and "more recent" refer to a period of not over ten years from the start of field development work.

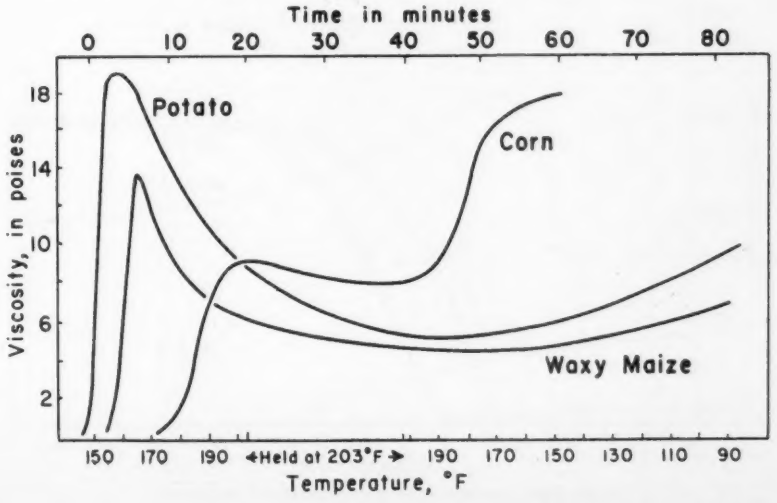
Cross-linked Starches

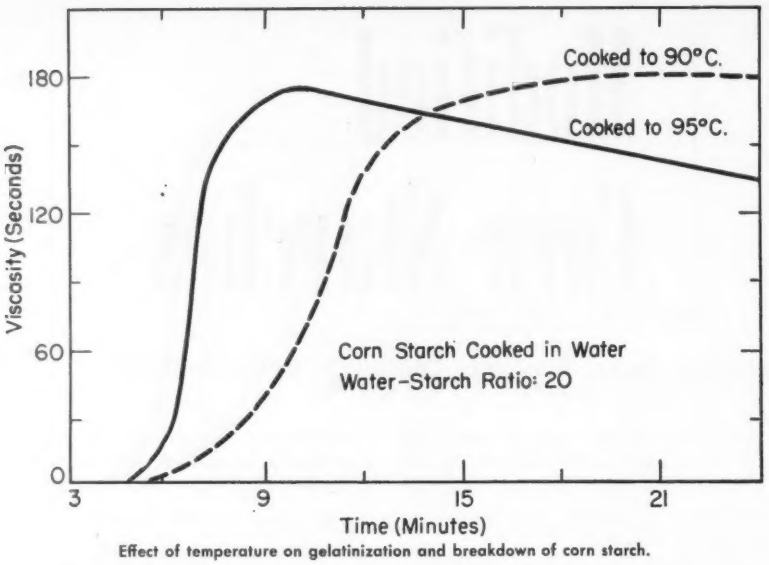
The cross-linked starches, sometimes called "inhibited" (to granule swelling), have received attention in a few laboratories in the corn wet-milling industry for about 17 years. Products being used in the largest quantities are those made from waxy corn starch. However, the treatments are being applied to corn and other starches, and uses have been found.

It might be well to describe here the development of new modified starches. Since the cooked or paste form is most common, problems arising in the behavior of pastes during cooking and cooling have motivated research on new starch products. Some of the variables, in addition to types of starch, are temperature, rate of cooking, agitation, and presence of other ingredients.

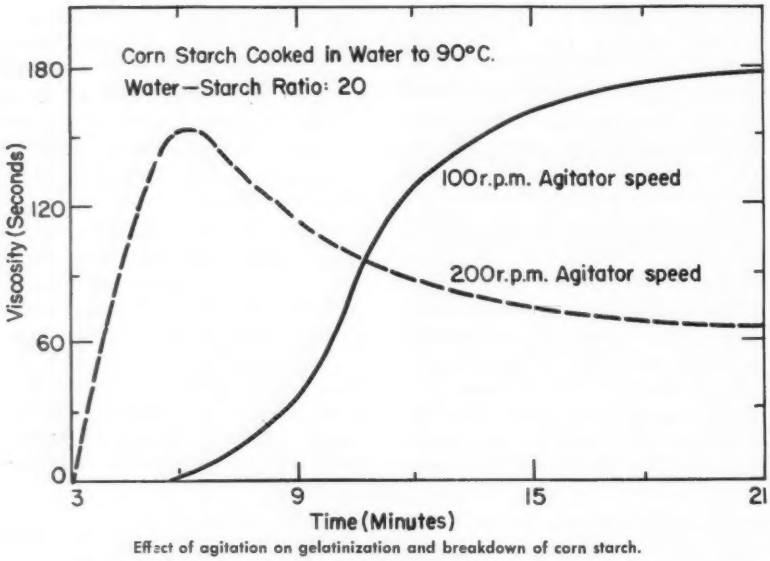
Native or unmodified starches of different botanical origin cook differently and show different hot and cold paste characteristics. In the viscosity graph, cooking and cooling curves for unmodified commercial corn, potato, and waxy maize starches show these differences. Corn starch, for example, begins to thicken or gelatinize at a higher temperature than does

Viscosity curves of potato, corn, and waxy maize starches, heated to 203°F. and then cooled. Concentration of corn and waxy maize pastes is 35 g. in 450 cc. of water; potato starch, 25 g. in 450 cc. water.

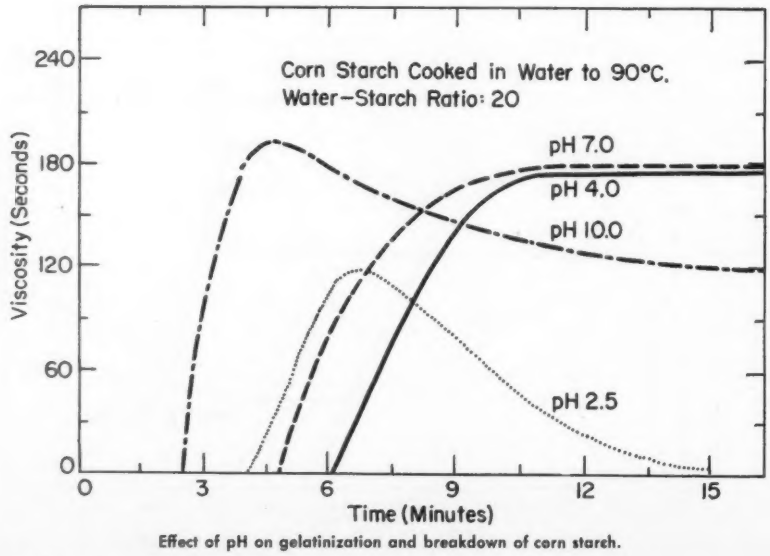




Effect of temperature on gelatinization and breakdown of corn starch.



Effect of agitation on gelatinization and breakdown of corn starch.



Effect of pH on gelatinization and breakdown of corn starch.

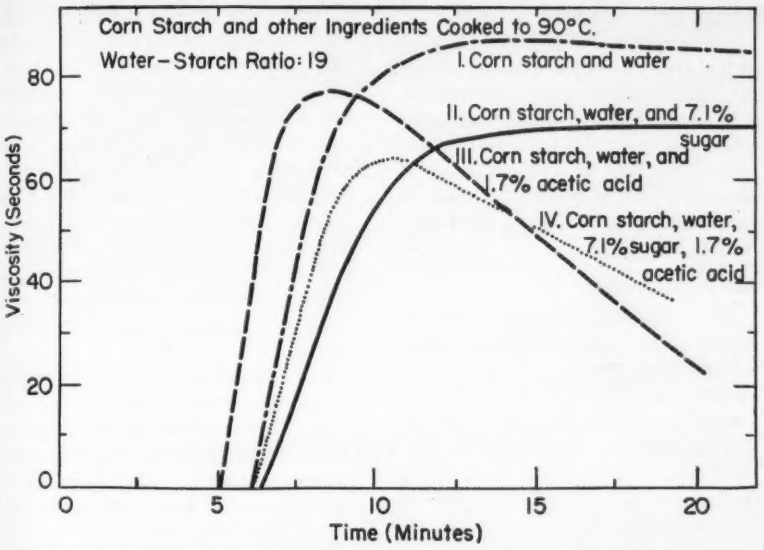
potato and waxy maize. Its paste thins out only slightly as cooking continues at 203°F., and when cooled the viscosity increases significantly. In contrast, potato and waxy maize starches reach, early in the heating period, a maximum or peak viscosity which thins out markedly with continued cooking. Viscosity increase during cooling is much less. These properties are important and explain in part why different starches are needed by users.

All unmodified starches are sensitive to small differences in cooking procedure. It is important to control such factors as temperature, time, degree of agitation, pH, and effects of other ingredients. The second graph shows the effect of temperature on the paste properties of unmodified corn starch. An increase of only 5°C. in final cooking temperature changes the characteristics of the cooking curve to such an extent that, to the inexperienced, use of a different starting material might be indicated.

In the third graph the effect of agitation on gelatinization and breakdown of corn starch is illustrated. The higher rate of shear results in an initial high peak viscosity, which is reduced as heating and agitation continues. The paste properties of these two "cooks" differ to such an extent that while one paste could be unsatisfactory in a given application, the other would be what is desired.

Hydrogen-ion concentration of the starch-containing mixture being cooked has a great influence on pasting or cooking properties. Changes brought about by employing pH values of 2.5 to 10.0 in a corn starch-water system are shown in another graph. In a pH range of 4 to 7 there is little difference in final paste viscosity. However, at a pH value of 2.5 such as occurs in some food products, the viscosity breakdown is severe and rapid. This characteristic makes unmodified starches unsuitable for use in such products if thickening is desired. There is also a viscosity breakdown at a pH value of 10.0, which would make this unmodified corn starch unsatisfactory as an ingredient in certain textile printing pastes.

Other ingredients, such as salt and sugar which are commonly used with starches, influence final paste characteristics. In the next graph the effect of acetic acid and sugar on gelatinization and breakdown of corn starch is illustrated. Sugar alone results in



Effect of other ingredients (acetic acid and sugar) on gelatinization and breakdown of corn starch.

slower gelatinization and in reduced final viscosity. The effect of acetic acid alone is quite different from that of a combination of acetic acid and sugar.

The reader may question, from this brief mention of the variables encountered in starch cooking, whether *any* starch could be used in some of the combinations that arise in industrial applications. This is a problem that has often confronted workers in the starch industry, with the result that many modified starches have been developed and put into use. The cross-linked starches serve as a good illustration of how some of the sensitiveness of unmodified starches has been overcome.

The effect of molecular cross-linking on gelatinization of waxy maize starch in 1.7% acetic acid is demonstrated in the final graph. Degree of cross-linking increases from sample II through sample IV. The high viscosity peak for the untreated material has been removed, as has the viscosity breakdown. Sample II, for instance, reaches maximum viscosity and retains this same viscosity over prolonged cooking and agitation. The advantages of such a product are evident; it has great tolerance to acetic acid and to variations in cooking times. Such products are used extensively in acid-containing foods such as fruit pie fillings and salad dressings. Samples III and IV, which have a higher degree of cross-linking, have not reached maximum viscosity under cooking conditions used. They can be used where acid conditions and/or mechanical shear is much more severe. The cross-linking treatment can be carried to such a degree that the treated starch granules show little or no swelling in boiling water or higher temperatures, as is done in the manufacture of surgical dusting starches.

Cross-linked starches are manufactured by the action of bifunctional or polyfunctional reagents with starch. These compounds are capable of reacting with more than one hydroxyl group of the starch to form cross-links or bridges from one starch molecule to the other. When the treatment is carried out with ungelatinized starch granules it appears that cross-linking of molecules on or near the surface occurs, with a resulting toughening of the granule.

A number of methods can be used to obtain cross-linked starches. The use of dihalides and epoxyhalohydrins in the presence of caustic to increase the viscosity of starch pastes was described by Maxwell (see alphabetical list of patentees, below). Konigsberg applied these reagents to ungelatinized starch granules. Caldwell reported the use of linear anhydrides

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Felton, G. F., and Schopmeyer, H. H. (to American Maize-Products Co.). U.S. 2,328,537 (Sept. 7, 1943).

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Wetzstein, H. L., and Lyon, P. (to American Maize-Products Co.). U.S. 2,754,232 (July 10, 1956).

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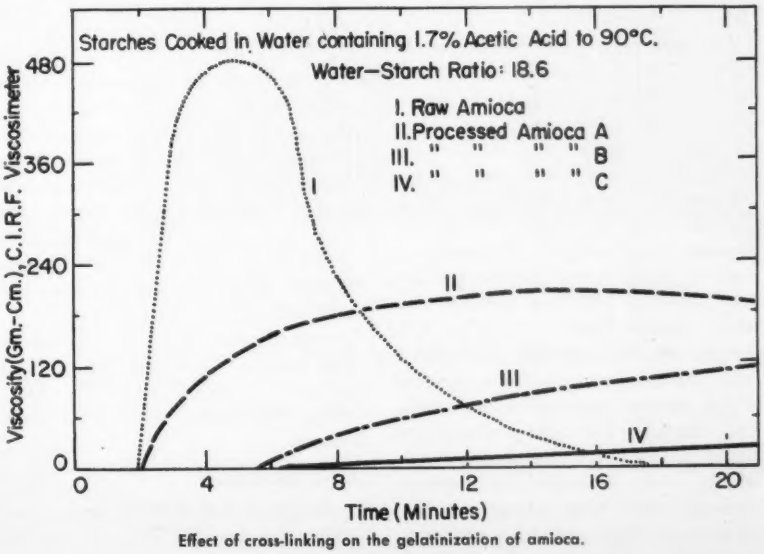

Effect of cross-linking on the gelatinization of amioca.

of dicarboxylic acids such as adipic, azolaic, and sebasic. Phosphorus oxychloride and antimony oxychloride were disclosed by patentees Felton and Schopmeyer, and a process improvement by Wetzstein and Lyon. A process using formaldehyde or acetaldehyde has been described by Kerr and Schink. Phosphorylating agents such as soluble metaphosphates are specified by Kerr and Cleveland and by Bus and Muetgeert.

Oxidized Starches

Oxidized or "chlorinated" thin-boiling corn starches have been known for years and are widely used in paper, textiles, and adhesives. Recent developments relate to improvements of this type of product.

Thin-boiling oxidized starches, with the characteristic halogenlike flavor removed, have been developed for foods. These products, in comparison to the classic acid-modified thin-boiling starches, produce pastes which are clearer, more free-flowing, and better film-formers and which show much less tendency to form gels on standing. These properties result in part, at least, from the carboxyl and carbonyl groups introduced in the starch molecules by the action of sodium hypochlorite. These modified corn starches are available in a wide viscosity range. A starch concentration as high as 30% may be used, with free-flowing pastes resulting.

Products having clearer and more stable pastes which, when dried, form clearer, more abrasion-resistant films have been developed for nonfood fields. Importance of these improvements for paper, adhesives, and textiles is self-evident.

In addition to the developments with thin-boiling oxidized starches there are those relating to the thick-boiling ones which are of considerable interest in the food field. It is well established that treatment of cereal starches with a fraction of 1% of chlorine or sodium hypochlorite will increase both hot and cold paste viscosities. Such treated starches have been used by the food industry for many years. More recently a different type of carefully controlled mild oxidation has been applied which greatly improves these modified starches. The new products are bland in flavor and give clearer pastes which, when subjected to pressure cooking, show little or no viscosity breakdown. Supported films are somewhat clearer and more flexible.

These mildly oxidized starches are being used in soups, gravies, sauces, pie fillings, bakery mixes, confections, puddings, baking powder, and many other products. It is believed that this type of product should not be overlooked by any one who is using, or has contemplated using, a thick-boiling cereal starch.

Starch Derivatives

Since starch is a high polymeric carbohydrate which undergoes organic chemical reactions and conversions common to all carbohydrates, it is an interesting starting material for many different types of derivatives. Considerable work has been done along these lines and many new products have been developed and more will appear in the next few years.

The development and application of hydroxyethyl corn starch ethers (see patentees Kesler and Hjermstad) has been most interesting and has been a valuable contribution. Such products, which have lowered gelatinization temperatures and which form relatively clear, noncongealing pastes, are being used extensively in adhesives, paper, and textiles. Products also are available for food uses.

Carboxymethyl starch ethers, while differing materially from the similar derivative of cellulose, are in commercial use as both food and nonfood products. The ones with low degrees of substitution have been the most successful to date. Pastes are clear, stringy, and nongelling. Some of the more highly substituted starches are applied in the textile and paper industries.

Although still in developmental stages, the so-called cationic and anionic starches are very interesting, and appear to have promise in many fields. These starch derivatives contain active charged groups of significant magnitude to be easily demonstrable either in slurry or paste forms. Made from corn starch, they give clear, stringy, nongelling pastes which will either stabilize or precipitate other ingredients incorporated with them, depending upon the charge present. Some of the methods for making these starches are described by Caldwell and by Wurzburg, Rutenberg, and Ross (patentees).

Corn Dextrins

Dextrins and British gums, prepared by heat-treating or roasting commercially dried starches, are well-established products in nonfood fields such as adhesives and paper. However, newer products now available are finding wider fields of application, including foods. Where a carbohydrate is desired having relatively low viscosity and relatively high solubility without sweetness and excessive hydroscopicity, dextrins perform very nicely. They are effective crystallization inhibitors and have water-holding properties superior to those of sugars.

Corn dextrins have been improved to such an extent that they are replacing tapioca and potato dextrins. Total solubility, paste stability, tack, filming properties, and flavor have been improved with both corn and waxy maize dextrins.

Precooked or Pregelatinized Starches

All the types of starches discussed are available in precooked form. The advantages of cold-water thickening make these products attractive to many users who cannot or do not wish to cook the starches prior to use. Recent technological work has brought out precooked cereal starches without the "starchy" or "adhesive" flavor which was so prevalent with these products for years. This introduction alone has increased the uses for precooked starches in foods.

Pregelatinized starches are used in instant puddings, frosting mixes, prepared breakfast cereals, bakery mixes, marshmallows and marshmallow toppings, pie fillings (both fruit and cream types), laundry starches, oil well drilling starches, paper, adhesives, and many other products.

Starch Fractions

Amylose and amylopectin fractionated from potato starch are now available in commercial quantities under the trade names Superlose and Ramalin.[1] Fractionation process and properties are described by Hiemstra, Bus, and Muetgeert (1) and by Bus and Muetgeert (patentees).

Work in this area is in the developmental stage, but it is anticipated that substantial uses for these starch fractions will be found in the near future.

Literature Cited

1. Hiemstra, P., Bus, W. C., and Muetgeert, J. M. *Die Stärke 8:* 235 (1956).

[1] Stein Hall & Co., Inc., 285 Madison Ave., New York 17, N.Y.

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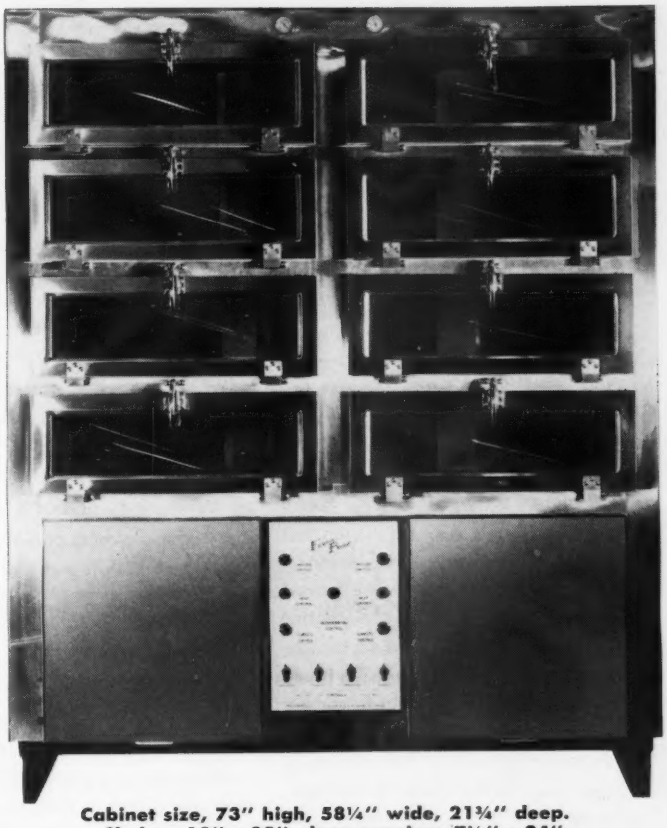

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NEWS FROM Pfizer

Quality Ingredients
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TECHNOLOGISTS SEE NEED FOR FORTIFICATION OF FOODS SUCH AS BREAD AND PROCESSED CEREALS WITH VITAMIN B_6

While a "minimum daily requirement" has not yet been established for Vitamin B_6, the most recent data suggest the human need for this nutrient may be even greater than for thiamine and riboflavin. A composite of recent studies indicates that as much as 2-7 mg. of B_6 may be desirable in the daily diet.

Although Vitamin B_6 is widely distributed in foods, a large portion appears to be lost or destroyed during processing or cooking. One study contrasting the B_6 content of wheat fractions shows that while whole wheat flour contains approximately 2.09 mg./lb. of B_6, patent flour contains only 0.99 mg./lb.—a loss of 50% B_6 content through processing. Almost all white breads on the market today contain only 0.45 mg. of B_6 *per one pound loaf.* When you add to this the fact that meat in cooking has been found to lose as much as 57% of its B_6 content and that canning and processing of foods markedly reduces their natural B_6 content, you can see evidence of a marginal B_6 intake in the diet today.

There would appear to be good reason for food processors to consider fortifying their products with Vitamin B_6.

If you would like further information on this subject, write Pfizer for a copy of Technical Bulletin 96 and "*VITAMIN B_6—The Case for Dietary Enrichment.*"

* * *

New Facts About Lysine Supplemented Bread

The quality and efficiency of wheat protein can be markedly improved by supplementation with the essential amino acid, L-Lysine. (Pfizer produces L-Lysine by a unique fermentation process assuring highest quality.)

A recent nutritional report compared the protein quality and quantity of white bread, protein bread and egg. It shows that nine slices of ordinary white bread are required to equal one egg in terms of quality and quantity of protein. If white bread is supplemented with lysine, only five slices equal one egg.

The report shows that protein breads can be improved in a similar manner. If protein bread is supplemented with lysine, three and one half slices instead of five provide the same protein quantity and quality as one egg.

If you would like further information on lysine supplementation of bread and other products such as breakfast cereals, write to Pfizer for Technical Bulletin 89, "*L-Lysine Monohydrochloride.*"

* * *

New BI-CAP® Enrichment Concentrate For Cornmeal

PFIZER BI-CAP® was one of the first enrichment concentrates. And this "head start" in vitamins has continued. It means that Pfizer can help you with the newest developments in enrichment products.

PFIZER BI-CAP has recently been improved through vitamin research. It is now a lighter colored enrichment mixture with an even riboflavin dispersion that overcomes unsightly agglomeration.

A new addition to the BI-CAP enrichment line is BI-CAP Bolted Cornmeal Enrichment. Pfizer also continues to offer its BI-CAP Degerminated Cornmeal Enrichment plus both single and double strength flour enrichment mixtures. If you would like further information write CHAS. PFIZER & CO., INC., Chemical Sales Division, 630 Flushing Avenue, Brooklyn 6, New York. Branch Offices: Chicago, Ill.; San Francisco, Calif.; Vernon, Calif.; Atlanta, Ga.; Dallas, Texas

American Association of Cereal Chemists

OFFICIAL REPORTS FOR 1957

ANNUAL REPORT OF THE TREASURER, 1957

The annual report of the treasurer covering the financial transactions and position of the Association is herewith submitted. Our operation for 1957 reflects a continuation of the trend to deficit operations noted during 1956. Increasing costs of "doing business" seem to plague the Association just as they do many other organizations.

During 1957 our total dollar handle (income plus expenses) was in excess of $129,000.00. When one considers that the average transaction is from $10.00 to $12.50, it is evident that the number of individual transactions is quite large, and the time consumed in handling them has increased considerably from 1950 to 1951 when our dollar handle was roughly $45,000.00.

Our operation for 1957 shows a decrease in assets during the year of $1512.59. This sum would have been considerably larger had it not been for the surplus from our annual meeting, increased advertising revenue, and sales of both Monograph II and *Cereal Laboratory Methods*. On the expense side of the ledger, printing costs have increased substantially, postage and office supplies are constantly rising, and so on. The federal government has only recently further increased the charges for postage on periodicals as well as first class mail.

Cereal Science Today was projected, at its inception, to reach a break-even point within two to three years. This goal appears to be within reach, and it now remains to be seen whether revenue growth will result in a substantial contribution to Association assets.

Growth in membership continues at a normal pace. We now have 1074 active members, 66 sustaining members, and 51 corporate members. Applications for new members processed to date for 1958 would indicate a continuation of growth, though at a somewhat slower pace.

It is quite evident from the financial statement that our financial situation is in need of improvement in anticipation of greater costs in the areas of printing, postage, enlarged office space (now being supplied gratis), and additional services to the membership. Steps in this direction have been recommended to the Board of Directors, who have seen fit to request that our members approve an increase in annual dues. This will be voted upon at the 1958 meeting in Cincinnati. Approval is essential if the AACC is to continue its growth and maintain its reputation as a first-class scientific group.

Respectfully submitted,
D. B. Pratt, Jr., *Treasurer*

Results of Operations, 1957

Income:		
Memberships	$12,789.00	
Subscriptions	11,391.39	
Advertising (gross after agency discount)	12,443.58	
Reprints	4,120.01	
Back issues	1,625.32	
Back issues, AACC *Transactions*	99.92	
Interest	573.46	
Annual meeting, surplus and reimbursement	4,849.45	
ASBC income	298.02	
Miscellaneous AACC	24.12	
Miscellaneous publications	553.39	
Monograph, Vol. I	18.53	
Monograph, Vol. II	1,286.86	
Decennial Index	107.80	
Cereal Laboratory Methods	12,089.57	
Total Income		$62,270.42
Expenses:		
Printing	$22,981.42	
Reprints	3,405.49	
Publication envelopes	576.75	
Salaries	15,531.67	
Office supplies	1,434.87	
Postage	1,898.57	
Advertising manager's commission	3,189.48	
Cereal Science Today promotion	424.63	
FICA payments	257.98	
Osborne Medal	1,115.47	
Traveling expenses	539.92	
Membership directory	228.35	
Annual meetings	2,731.90	
Vol. II royalties	164.39	
Cereal Laboratory Methods	10,061.34	
Depreciation	285.87	
Bad debts	189.92	
Decennial Index	100.00	
Miscellaneous AACC	757.15	
Miscellaneous publications	1,121.31	
Total expense		$66,996.48
Association assets, December 31, 1956		$23,340.71
Decrease in surplus (1957)	4,726.06	
Reduction in monograph inventory, 116 at $4.70	545.20	
CLM inventory, 767 at $5.22	4,003.74	
Decrease in assets, December 31, 1957		1,267.52
Association assets, December 31, 1957		$22,073.19

Distribution of Surplus to Activities

Publications:			
Assets, December 31, 1956		$10,505.50	
Income 1957	$39,563.61		
Expenses 1957	45,363.61		
Operating deficit		5,800.00	
Assets, December 31, 1957			$ 4,705.50
Association:			
Assets, December 31, 1956		8,377.10	
Income 1957	9,204.05		
Expenses 1957	11,319.87		
Operating deficit		2,115.82	
Assets, December 31, 1957			6,261.28
Monograph, Vol. I			
Assets, December 31, 1956		810.95	
Royalties, 1957		18.53	
Assets, December 31, 1957			829.48
Monograph, Vol. II			
Assets, Dec. 31, 1956		774.46	
Income, 1957	1,286.86		
Expenses, 1957	249.86		
Operating surplus		1,037.00	
Inventory, Dec. 31, 1956 (453 books at $4.70)	2,129.10		
Inventory, Dec. 31, 1957 (337 books at $4.70)	1,583.90		
Decrease in assets		545.20	
Assets, December 31, 1957			1,266.26
Decennial Index:			
Assets, December 31, 1956		$ 442.07	
Income, 1957	7.80		
Expenses, 1957	1.80		
		6.00	
Allocation, 1957		100.00	
Assets, December 31, 1957			548.07
Cereal Laboratory Methods:			
Assets, December 31, 1956		2,430.63	
Income, 1957	12,089.57		
Expenses, 1957	10,061.34		
Operating surplus		2,028.23	
Inventory, 767 at $5.22		4,003.74	
Assets, December 31, 1957			8,462.60
Total Assets, December 31, 1957			$22,073.19

Assets and Liabilities, December 31, 1957

Cash on hand:		
Checking account	$ 6,394.13	
Savings account	3,434.08	
Petty cash	257.63	
		$10,085.84
Current liabilities:		
Balance due on WHT and FICA taxes	168.80	
Accounts payable — FICA taxes	49.57	
Monograph accounts payable — royalties	164.39	
Dues received	8,975.00	

Subscriptions received	5,814.38	
		15,172.14
Cash position (red)		$ 5,086.30
Assets:		
Accounts receivable (1956)	36.20	
Accounts receivable (1957)	2,348.82	
Series G bonds	7,000.00	
Series F bonds	9,614.00	
Equipment	2,572.83	
Monograph inventory	1,583.90	
CLM inventory	4,003.74	
		$27,159.49
Association Assets — December 31, 1957		$22,073.19

AUDITING COMMITTEE

The Auditing Committee, with the services of an expert accountant, has reviewed the financial statement of the Association for the year 1957. The treasurer's report accurately reflects the financial condition of the Association as of December 31, 1957. We have also confirmed the presence of bonds in the safety deposit box, as valued in the statement.

The detailed report of the accountant has been forwarded to the Board of Directors.

P. N. LEVERENTZ, *Chairman*
F. D. SCHMALZ
HARRY G. OBERMEYER

Audit for the San Francisco Meeting

We have carefully examined the expenditures, receipts and payments made by the 1957 Local Arrangements Committee. The financial report made by that committee and presented to the Board of Directors appears to be correct.

CLAUDE F. DAVIS, *Chairman*
WESLEY NOBLE

Report of Board of Directors

Means of increasing the income of the Association has been the Board's primary concern. The fine response of the local sections to the request that they subscribe to CEREAL SCIENCE TODAY for their nonnational members significantly increased the circulation of CEREAL SCIENCE TODAY. This, combined with a growing interest in this publication (worldwide), has made possible an increase in advertising revenue. However, growth has not been rapid enough to offset the over-all deficit of the Association. For this reason, the Board voted to request the membership to permit an increase in dues.

To provide continuity and assure the best financial arrangements for our annual convention, Ray Tarleton was appointed Convention Manager. Convention cities and dates already approved by the Board are: Washington, D.C., May 3–7, 1959; Chicago, Illinois, May 1–5, 1960; Dallas, Texas, April 9–13, 1961; Kansas City, Missouri, April 29–May 3, 1962, and Minneapolis, Minnesota, April 28–May 2, 1963.

The Monograph Committee appointed by the Board will meet during the annual meeting to select an editor for and outline a new monograph on cereal chemistry and technology.

WILLIAM B. BRADLEY, *Chairman*

Report of the Editor of CEREAL CHEMISTRY

The six issues of CEREAL CHEMISTRY published in 1957 (Vol. 34) contained 478 pages, comprising 51 research papers and 1 Communication to the Editor. The 1956 issues consisted of 402 pages and contained 41 research papers, 1 Communication to the Editor, and 5 Book Reviews. After the publication of *Cereal Science Today* was begun, all book reviews have been published in this journal.

A total of 80 manuscripts were received in 1957; of these 13 have been published, and 28 have been accepted and are awaiting publication. Three manuscripts have been withdrawn, one rejected, and one transferred to *Cereal Science Today*. Thirty-four manuscripts are being revised or reviewed.

There is a larger backlog of manuscripts on hand than has been the case for several years and a larger volume could be published in 1958, if funds are available.

Under the rotation scheme established in 1954, two of the eight members of the Editorial Board retire each year. Doctors Marlo Dirks and Byron S. Miller were first appointed to serve on the Board in 1957. Doctors MacMasters and Olcott completed their tenure in December of this year and Dale Mecham and Dorothy S. Bradbury have been appointed to fill these vacancies.

The editor is indebted to the members of the Editorial Board for their helpful counsel and advice during the past year. Also thanks are due to many members of the AACC as well as others who have acted as reviewers.

W. F. GEDDES

Report of the Editor of CEREAL SCIENCE TODAY

With the current issue, CEREAL SCIENCE TODAY completes its second year of publication. The policy formulated to guide this new journal at its inception has been helpful and seems to have been sound. Comments from AACC members and other readers are more favorable than otherwise. From these we conclude that CST is fulfilling the role intended for it. Nevertheless, we solicit constructive criticisms. By combining what we can learn from such criticism with what we have already learned by experience, we should have a better magazine in the future.

Much of the material for CEREAL SCIENCE TODAY is voluntarily contributed by Association officers, Department Editors, Corresponding Editors, AACC members, and others. Many of the papers are solicited in order to give our readers timely articles by qualified authorities on various subjects. Articles are accepted for publication on the basis of their value and interest for a significant portion of our readers. The Association does not accept responsibility for statements and opinions advanced by contributors or the editors. Persons who do not agree with our authors will be given an opportunity to present their views in CST.

The scope of CST is considered to include the following:

1. News of AACC activities, its local sections and its members.
2. Feature articles on cereal science or related subjects.
3. Technical articles of a review type, or dealing with applied technology, analytical techniques, etc.
4. News of technical or scientific developments of interest to cereal chemists.

In addition to keeping us all better informed about our own field, it can help acquaint others with cereal chemists and what they do in industry, government, laboratories, and universities.

As a matter of AACC policy, most of the financial support for CST comes from advertising revenue. Readers

should remember that more advertising revenue will make possible a bigger, better magazine.

PAUL E. RAMSTAD

Report of the Managing Editor of Association Publications

The publication of *Cereal Laboratory Methods* in March of 1957 marked the peak of a very busy year for the headquarters staff. The sales and distribution of this volume, when added to an already heavy workload, forced us to postpone completely a number of special projects and delay others in progress. It was hoped that closer contact could be maintained with the officers of the Local Sections and more information provided them on new members in their areas, etc. We have at last caught up with routine work and will endeavor to put a number of these projects into the works during 1958.

The sale of *Cereal Laboratory Methods* has been quite good. At the end of 1957 we had recovered about 98% of our original investment. The small surplus that will accumulate from selling the remainder of the copies on hand will be used to begin work on the next revision.

The circulation of CEREAL SCIENCE TODAY continues to increase, although at a gradual rate. The sale of advertising for 1957 was slightly higher than anticipated, and this trend appears to be carrying over into 1958. With the continued support of all AACC members we should approach the break-even point by the end of the year. It is the intention of the editor, Dr. Paul Ramstad, to increase the size of CST over the next few issues. Good editorial material is being submitted at an increasing rate, and each issue should prove more useful to readers than the last. We again urge each and every member to support CST advertisers and to let nonadvertisers know that their absence is noticed. Every page of advertising means more editorial material for AACC members at less cost.

The year 1957 saw Monograph II almost reach the break-even point. On December 31, 1957, the book was within $200 of the total expense figure. Thus we have recovered our original investment in four years instead of the estimated five years. Income from the few remaining copies will be used to initiate work on Monograph III, a new Monograph on cereal chemistry, now in the early planning stage.

We mentioned last year in our report that office space in St. Paul was less than adequate. As every year passes the space problem becomes even more acute. Storage of vital and historic AACC records takes up more and more of our available work area. Yet our headquarters must accommodate these. In the past each officer kept his own files and as a consequence many of our important documents are scattered throughout the attics of the United States. We are trying to centralize our records in St. Paul and set up a master file for each member, containing his membership application blank and any correspondence, press clippings, etc., associated with him. This is common procedure in many organizations, but the AACC has never had the staff or the facilities to undertake the project. In addition, we have acquired over the past eight years a group of office machines that enable our small staff (two full-time, one part-time) to accomplish many jobs that were formerly contracted to the printer. Not only do we save substantial sums doing the work ourselves, but service is speeded up and errors reduced to a minimum. The only trouble with this arrangement is that machines take up space, and space is at a premium.

Curiously enough we have arrived at a point where several new pieces of equipment could be bought and paid for by the resulting savings in time and labor, but lack of space prevents us from acquiring them. Lack of adequate office space is beginning to affect our operating efficiency. It is hoped that in the near future more space can be acquired, but any such move must await an improvement in our financial picture.

One of the many compensations of professional association work is the cooperation received from the members. The AACC is certainly no exception, and a good demonstration of this occurred last fall when AACC members were asked to complete a business classification questionnaire. Over 82% of the members responded on the first notice. The results should be of interest to all:

> Of the returns received, 68.8% indicated they were manufacturers or processors; 15.9% were associated with independent and government laboratories or were consultants and faculty of universities; 15.3% indicated they were suppliers of ingredients, services, and laboratory equipment or products. Of all the members who are manufacturers or processors, the returns showed that 84.5% are research directors or chemists and technicians in research and quality control; 12.6% reported they were production executives or corporate officials; 3% indicated they were in technical sales and service.

These returns are being distributed in the form of an attractive brochure to potential advertisers. Included also are results from a group of nonmember readers of CST. We will be happy to send a copy to any member interested.

R. J. TARLETON

AACC Representative to the American Association for the Advancement of Science

The 124th convention of the AAAS was held December 26-31, 1957, at Indianapolis. More than 1000 papers were presented on a wide range of subjects, with emphasis on nuclear energy, space travel, human behavior, and other related topics. Speakers and subjects included Nobel prize winner Dr. Hermann J. Muller of Indiana University, humanistic factors in the radiation problem; Dr. Paul B. Sears of Yale University and retiring President of the Association, the inexorable problem of space; Dr. Th. Dobzhansky of Columbia University, evolution at work; Sir R. A. Fisher of Cambridge University, interpretation of statistical data in the observational sciences; Dr. E. C. Stakman of the University of Minnesota, a long search for understanding; and Crawford H. Greenewalt, president of E. I. du Pont de Nemours & Co., the fickle fashions of science.

The council voted several resolutions, two of which are as follows: 1) The council approves in principle the general adoption of the metric system of weights and measures; it tenders its cooperation to the British association in any practicable efforts to further this objective. An AAAS committee will study the most economic and feasible methods of changing over to metric usage in their own and allied fields, to be reported upon at the next AAAS meeting.

2) In the present period of concern over technological development in the United States, the public may mis-

understand the basic needs of science, and in the attempt to emphasize technology there is danger that support of research in basic sciences may be diverted and that scientific development in certain areas, which will be greatly needed in the future, may even be reduced; therefore the AASS urges recognition that science is a major element in the peacetime strength of our country; that stimulation of activity in technology alone is not enough to increase or even to maintain this strength; and that scientific development in all areas needs continued and increased support; and further, that any effort to stimulate science in our country must take into account the unity of nature and must recognize the need for research in all classes of natural phenomena, whether physical or biological. It is urged, therefore, that in addition to development of technology, increased recognition and adequate continuing financial support shall be given to basic physical, medical, biological, and social sciences, and to scientists in these fields.

The council also voted to sponsor a 2-day Parliament of Scientists consisting of the AAAS Committee on Social and Political Aspects of Science and one representative from each of the 270 technical and scientific organizations affiliated with AAAS. The function of the parliament (held in Washington in February) will be to give Congress the views of scientists on legislation affecting science and scientific education. The parliament will be a sounding-board for such proposals as government financial science scholarships, science student-loan funds, graduate fellowships, institutes for science teachers of secondary schools, a proposed federal department of science, and the proposed national school of science.

BYRON S. MILLER

Employment

Although business for the Employment Committee during the past year has been good, it has not been as lively as might have been expected. There has been a steady flow of requests for openings and likewise a steady number of employers seeking suitable employees. One might be led to believe that in view of the general unemployment, cereal chemists would be laid off and thereby the supply would far outnumber the available openings.

Just at the present time the committee has five applicants and four openings listed in its files. Several men during the past year have found locations through the efforts of this committee. Likewise, several openings have been filled.

There appears to be a steady demand for men of good training and experience in cereal work.

ROWLAND J. CLARK, *Chairman*

Membership Applications

During the calendar year 1957, the committee has processed 78 applications. Of these, 76 were approved for active membership, one for sustaining, and one for corporate membership. Besides the United States and Canada, the new membership list includes names from Holland and England.

The members, in general, have been diligent in screening applicants. Only one applicant was recommended for sustaining rather than active membership by the committee. However, in some instances requests for greater detail of duties was necessary for applications with insufficient educational requirements.

ROBERT KOCH, *Chairman*

Nominating

The committee wishes to commend the various Local Sections for the excellent cooperation received in choosing suitable candidates for the nominating ballot. This was true in spite of the fact that the Local Sections were unavoidably pressed for immediate action.

The nominating ballot contained sixteen names for three positions, the president-elect, treasurer, and a member-at-large of the Board of Directors. From these sixteen names, nine were chosen by the Association membership in accordance with the Constitution, to appear on the election ballot for the three positions.

Your committee wishes to thank the many individuals responsible for the preparation of such an excellent ballot, and particularly for the rapid action of the various Local Sections.

W. W. PROUTY, *Chairman*

Publicity

During the past year the committee has been continuing its efforts to secure greater and more effective publicity. The coverage of the San Francisco meeting was excellent in most areas. The use of a "press room" at the meeting was continued and the numerous news releases proved popular and worth while. All major trade publications and a number of scientific journals participated in the coverage. As at previous meetings, many photographs were taken by our cameramen, some of which appeared in CEREAL SCIENCE TODAY and others in publications throughout the country. Some excellent news press coverage was secured, though need for a greater effort here has prompted a special appointment of a member of the committee on the local scene to coordinate important releases to the local news agencies.

Using the experience gained from publicity effort on the New York and San Francisco meetings, your committee has attempted to establish a useful publicity schedule for future meetings. An outline of this schedule was submitted last October to those concerned in developing publicity for the Cincinnati meeting. It proved difficult to meet the deadlines set up in the schedule for submitting finished material to St. Paul for publication. However, this was due in large part to the early meeting date. Your committee recommends that this approach be continued to obtain easier coordinated effort by all concerned with publicity, and to assure that all publicity material reaches St. Paul well before deadline dates. Toward this end the committee has prepared a new outline of the schedule to be immediately available for the new local arrangements and program chairmen. The committee hopes this action will result in clearer understanding of the publicity goals sought and assure the desired continuity.

WILLIAM J. SIMCOX, *Chairman*

Thomas Burr Osborne Medal Award

Since the Osborne Medal Award was made at our 1957 meeting, the activities of the committee have not progressed sufficiently to warrant a report at this time.

BETTY SULLIVAN, *Chairman*

TECHNICAL COMMITTEES

Technical Policy Committee

The Technical Policy Committee of the Association consists of the chairmen of the technical committees. The

committee included 15 members, in addition to the chairman, during 1957-58. The 15 technical committees included approximately 150 members of the Association.

The Technical Policy Committee is charged with the responsibility of establishing policy and execution of plans designed to bring about uniformity of methods of analysis and to develop new methods of analysis of cereal and related products. The Technical Policy Committee has been engaged during 1957-58 writing a "Code of regulations" which will serve as a guide on organization of the technical committees; will provide a system of classifying methods according to *tentative* or *standard;* and will place the responsibility for revision of *Cereal Laboratory Methods* in a subcommittee of the technical policy group.

A few of the technical committees have made excellent progress during 1957-58. Progress in others has been minor. The Cereal Sanitation Committee under chairmanship of Kenton L. Harris is planning a Sanitation School to be held during 1958. The Farinograph Standardization Committee under Max Milner is also planning a workshop designed to give instruction on how to standardize the farinograph. The Soybean Analysis Committee under L. R. Brown has completed its study of methods of assay for urease. The method has been published in CEREAL SCIENCE TODAY and is on file for a future edition of *Cereal Laboratory Methods.*

Other technical committees, annual reports of which are published herewith, demonstrate the progress that is being made in technical problems of the association.

JOHN A. JOHNSON, *Chairman*

Bran in Flour

The committee has been inactive during this past year. However, a paper giving details of "A direct method for determination of bran in flour" is now in the hands of the editor of CEREAL CHEMISTRY. After its publication, extensive collaborative testing of the method will be started. The committee had decided earlier on this sequence of events.

W. L. DEATHERAGE, *Chairman*

Cake Flour

On the basis of work accomplished by this committee under the previous committee chairman, our work this year has been to continue our collaborative work along the same lines. In the interpretation and scoring of results there has been a continued discrepancy between the collaborators in the area of appraising the external characteristics of the cake. Work this year has been directed towards bringing these factors more in line before proceeding with work in the area of developing a most suitable test formula. Such variations as oven condition, barometric pressure, and type of oven all seem to have a direct influence on the external characteristics of the cakes. At this time it seems possible that some means of correction can be applied to adjust for variations in these areas. Committee members have baked two series of cakes where temperature and baking time were the only variables, and a second series using a base mix where flour was a variable. The accumulated data from these tests are in the process of assembly and will be distributed to committee members as soon as completed.

D. B. PRATT, JR., *Chairman*

Cookie Flour

During the past year the committee has continued collaborative work in an effort to improve the present AACC Spread Factor Test. Each of the eight members on this committee was sent all the ingredients necessary to perform ten bakes — five bakes using the regular formula, and five using a no-milk formula. All the bakes were to be made at an oven temperature of 425°F.

Each collaborator mailed his cookies to L. H. Fratzke in Detroit, where they were compared and scored. The top appearance of the cookies baked in different laboratories showed quite a variation, and hence it seems necessary that this work should continue along these lines to eliminate such differences.

LESTER J. BRENNEIS, *Chairman*

Cracker Flour

The effect of aging cracker flours was studied for a period of 2 years. Commercial unbleached flours of 1955 wheat crop, stored at 70°F., were used. The behavior of the doughs in mixing, fermentation, machining, and baking was in the limits of production of a good soda cracker. Changes during this time appeared to be in cycles and indicated that the bacterial flora from the flours and the enzymes produced by these bacteria had a predominating effect in the processing and the quality of the finished product. The drying effect of the flours observed in the laboratory was not found in the flours that were stored under commercial conditions.

JAN MICKA, *Chairman*

Farinograph Standardization

The first collaborative study of constant flour and constant dough weight methods using six flours has been completed, and consideration is now being given to the publication of this report as well as to future studies suggested by this work. In a co-operative undertaking with manufacturers of farinograph equipment, the committee is developing operation specifications and tolerances for a standard farinograph mixing unit.

MAX MILNER, *Chairman*

Feed and Feedstuffs Analysis

Subcommittee on Mineral Analysis — Edward E. Chapman, Chairman

The work of this subcommittee has been a general survey of the different methods found in the publications of the AOAC, AACC, AOCS, etc., and evaluating them. Future plans and ideas will be discussed at the committee meeting to be held during the 1958 AACC convention in Cincinnati, Ohio.

Subcommittee on Drugs, Antibiotics, and Hormones — Robert C. Wornick, Chairman

Assay procedures for drugs, antibiotics, and hormones in feeds are studied mainly by the AOAC. It has been and will be necessary in the future to work closely with this association. O. L. Kline of Food and Drug Administration, who is referee on nutritional adjuncts, has been advised of AACC activities in this field and has been informed that it will be necessary for the AACC Subcommittee on Antibiotics, Drugs, and Hormones to contact the associate referees in his group on specific assays. Similar correspondence has been carried on with R. T. Merwin of the Connecticut Agricultural Experiment Station, who is AOAC referee on drugs in feeds.

A series of letters were sent to a number of individual associate referees covering specific methods. Several of the methods adopted by the AOAC at their meeting in Washington, D. C., last October are awaiting publication in the *Journal of the AOAC*. Others require collaborative study for adoption.

There is quite a group of newer drugs now in use which have not yet been studied officially by the AOAC. These include Dow "Trolene" (ET-57), Sterwin "Trithiadol," Lilly "Hygromycin," Abbott "Gallimycin" (Erythromycin), Merck "Glycamide" (Glycarbylamide), and Salsbury's "Unistat." The chairman of this subcommittee is contacting the manufacturers of these newer drugs for copies of the methods of assay.

Subcommittee on Vitamin Analysis — Ernest F. Budde, Chairman

During the past year, methods of vitamin assay published by the AOAC, the Association of Vitamin Chemists, and the AACC were reviewed. Methods in routine use by feed mill chemists are being solicited. It is hoped to write up detailed procedures for the more commonly determined vitamins, based on published methods. These will be submitted to a committee yet to be appointed, for collaboration.

Subcommittee on Proximate Analysis — Louis E. Schonlau, Chairman

No definite progress has been made by this subcommittee. Discussion of this activity will be made at the 1958 AACC convention in Cincinnati, Ohio.

MAXWELL L. COOLEY, *Chairman*

National Check Sample

The membership of the AACC continues its active participation in the services offered by this committee. The following series are presently available for analysis.

A & B	Hard wheat flour
C	Soft wheat flour
D	Feed
E & F	Fragmentation
HS & HL	Farinograph
I	Amylograph

Please contact the chairman of your committee for detailed information on the above-mentioned Check Sample Service.

LESTER H. FISCHER, *Chairman*

Prepared Baking Mixes

This committee was reactivated after a year of inactivity and divided into several subcommittees. These subcommittees have not all functioned actively because it has been necessary to set up specific experimental projects; this sometimes requires a tremendous amount of correspondence.

Subcommittee for Determination of Plasticity of Fats and Emulsifiers — Donald C. Meek, Chairman

Preliminary evaluations and ideas of possible procedures are almost ready for distribution to committee members for further study.

Subcommittee for Determination of Hydrolytic Rancidity — Edward I. Feigon, Chairman

Several suggested procedures have been compared, but no formal program has been undertaken.

Subcommittee for Evaluation of Emulsifiers

This committee has not been active because the chairman was forced to resign early in the year.

Subcommittee on Rate of Hydration of Powdered Milks (Inactive)

Subcommittee on Rate of Reaction of Leavening Agents — Richard D. Haynes, Chairman

A good deal of work was done in the laboratories of the chairman. Much of this work has culminated in the distribution of a new procedure for evaluating the rate of reaction. Collaborative work is planned on this procedure for the coming year. The research work leading to this procedure is to be reported at the annual meeting.

Subcommittee on Yeast-Raised Products — David E. Downs, Chairman

A test baking procedure for sweet doughs has been under development and evaluation for 2 years. The procedure will be presented for adoption as a tentative Official Method at the annual meeting.

W. F. SCHROEDER, *Chairman*

Soybean Products

A joint AACC-AOCS committee completed an extensive study on the determination of urease activity in soybean products, the results of which appeared in the January 1958 issue of CEREAL SCIENCE TODAY.

Plans are being made for 1958–59 to study the determination of nitrogen solubility of soybean products, and again it is hoped that this work can be done in collaboration with a committee from the American Oil Chemists' Society.

JOHN A. JOHNSON, *Chairman*

Test Baking

This committee has been on a stand-by basis since our last annual meeting, awaiting certain decisions of the Specification Committee as to the correct determination for Absorption, Mixing Time, and Diastatic Capacity.

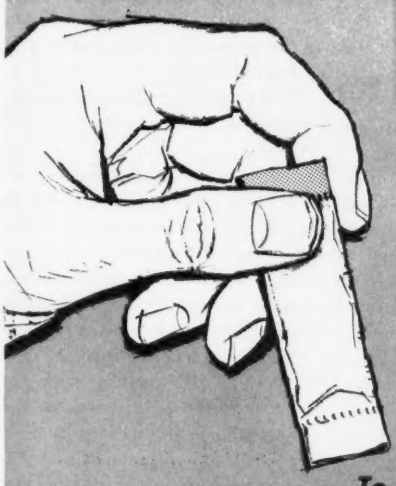
LESLIE D. LONGSHORE, *Chairman*

Vitamins and Minerals in Enriched Cereal Products

This committee has continued its study of the fluorometric method for the determination of riboflavin in cereal products. A literature survey was conducted and copies distributed to committee members. A comparative laboratory study was made of four commonly used procedures, with enriched bread and enriched flour as the samples. On the basis of results of collaborative tests during the past 2 years the committee is ready to begin a critical study of each step of the procedure. The objectives will be to find the simplest method applicable to the analysis of cereal products and to determine the limits of variation permissible in each step.

The revised thiochrome procedure for the determination of thiamine in cereal products, developed by the committee in the years 1953–1956, was published in the January, 1958 issue of CEREAL CHEMISTRY. This procedure was approved by the Technical Policy Committee of the Association.

W. G. BECHTEL, *Chairman*

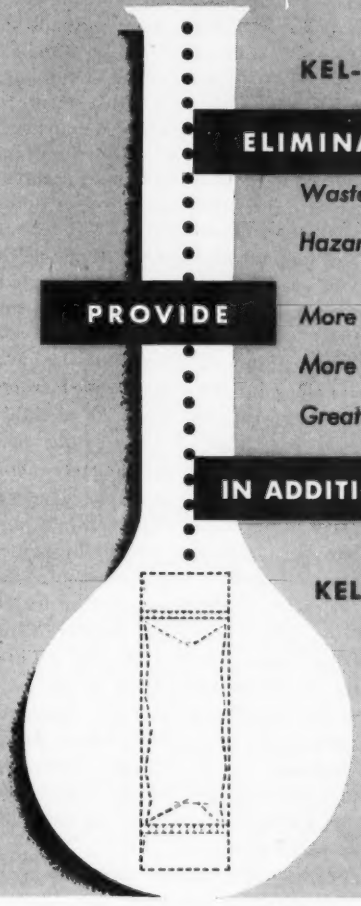


FOR YOUR CONVENIENCE

Harshaw KEL-PAK Digestion Catalyst Powders

Harshaw KEL-PAK Powders are carefully compounded mixtures of Potassium Sulphate; Mercuric Oxide and/or Copper Sulphate in sealed polyethylene packets containing sufficient catalyst for one protein determination.

To use, simply drop one packet into flask



KEL-PAK POWDERS

ELIMINATE *Messy mixing operations*

Waste due to spillage and spoilage

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PROVIDE *More uniform mixtures*

More accurate additions

Greater speed in adding catalyst to flask

IN ADDITION.. *Polyethylene packet reduces foaming*

KEL-PAK POWDERS are available in 5 formulas

#1 9.9 grams K_2SO_4; .41 gram H_gO; .08 $CuSO_4$
#2 10 grams K_2SO_4; .3 gram $CuSO_4$*
#3 9 grams K_2SO_4; .35 gram H_gO*
#4 10 grams K_2SO_4; .7 gram H_gO*
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the President's Corner

news of the association

The Function of the Secretary

Duties and responsibilities of the secretary have changed little during the substantial growth of the Association in recent years. The office remains pretty much that of scribe to the organization and junior patron of the Local Sections. The term "corresponding and recording secretary" aptly describes its function. Life for the secretary is relatively easy-going for much of the year, but it certainly livens up at convention time! The traditional March meeting of the Board of Directors is scarcely sufficient warm-up for the hectic convention week. Two business meetings, two Board meetings, and the section officers' meeting all have to be recorded accurately for posterity. (From my brief experience these seemingly can be expected to go smoothly enough. The hard part appears to be transcription of notes upon return home. In truth, I hardly dare turn my back on my normal handwriting, let alone the desperate attempts at shorthand that have cooled for several days in a brief case.)

In the By-Laws, the official description of duties for the secretary reads as follows: "The Secretary shall (1) keep a record of the minutes of the Board of Directors and transmit copies to the Board members; (2) keep a record of the minutes of the general meeting and transmit copies to the other officers of the Association; (3) carry on the general correspondence of the Association and keep the President and President-Elect informed currently by transmission of copies of his letters. He shall also maintain close contact with the Local Sections and carry on intersectional correspondence."

Interwoven among these directives are a number of more or less traditional duties. Together with the newly acquired responsibility as a member of the Board of Directors, the various duties of the secretary can be grouped informally somewhat as follows:

At conventions he is expected to maintain a working office to provide the president, president-elect, and Board of Directors with reference information, past records, actions, proposed agenda, stationery, and supplies; to work closely with and be available to the president throughout the meeting to make sure that proper and necessary material is presented at each of the two business sessions, and to assist wherever possible in the conduct of the meeting itself; to take the necessary minutes during meetings to ensure the presiding officer proper continuity on motions, discussions, seconds, etc.; to gather all papers presented at meeting for transmittal to the editor-in-chief; to make announcements desired by the president or local arrangements committee — usually including reading names of members deceased during the preceding year, reading of messages and telegrams of good wishes, etc.; to act as secretary for the section officers' meeting and provide the section chairmen and secretaries with a digest of that meeting.

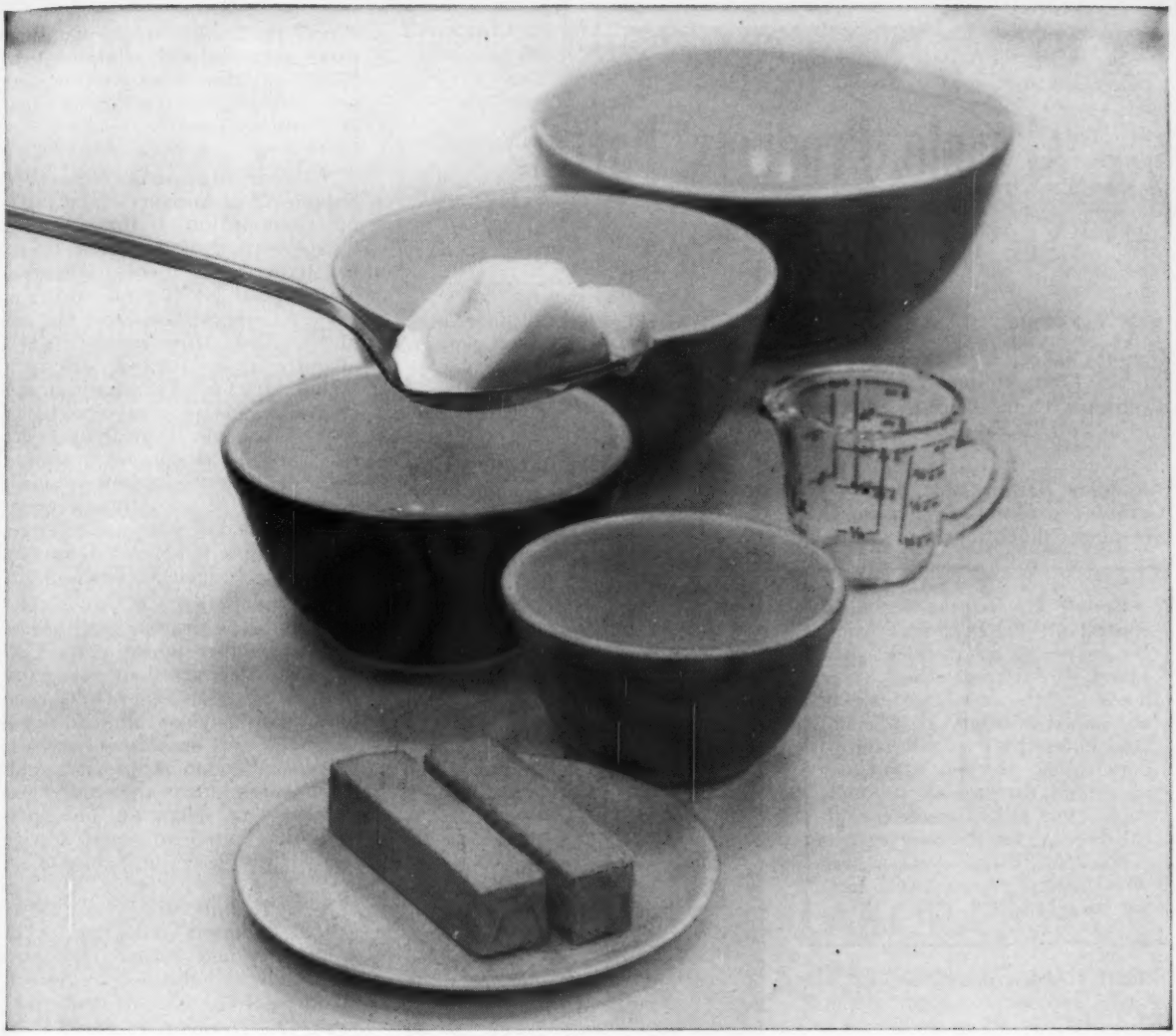
Immediately following the convention, edited transcripts of minutes of the several meetings are prepared and copies distributed to the proper individuals. Extra copies and original master copies are maintained in the files for future reference and possible preparation of additional copies. An up-to-date list of section officers is compiled for all of the national officers as well as the section secretaries. The list is kept current during the year through contact with the sections. In keeping with the wishes of the Resolutions Committee expressed at the annual meetings, letters are written to immediate families of deceased members expressing the regrets of the Association. Activities of all members who were actively engaged in Association work during the previous year are acknowledged, and an offer is made to transmit a letter of gratitude from the president to the member's employer, if desired. Acknowledgment in the name of the Association is made to all guest speakers and to all authors, even though not members, who participated in preparation or presentation of papers on the program. Appreciation is expressed to the hotel and staff for services and hospitality received during the convention. All other adopted resolutions are complied with.

Throughout the year all requests for information or service are handled suitably or referred to the proper officers for handling. For example, membership reinstatements or membership applications to the treasurer, general subscription information to the business manager, etc. The numerous requests received from nonmembers for membership lists are nearly all tactfully refused as being contrary to policy. A copy of the section officer list is sometimes supplied to transportation companies who have found it useful in previous years. Questionable requests are referred to the Board of Directors for evaluation.

The most important change brought about for the secretary as a result of incorporation of the Association was his elevation to the status of director. Thus, he must not only record accurately all actions of the board, but must weigh all decisions carefully and cast his vote for the good of the Association according to his best judgment. In this period of development of the Association into an alert, vigorous organization fully abreast of demands of the times, the secretary shares with other board members the sober responsibility of guiding the Association along pathways proper for the attainment of its stated aims and according to its stated precepts.

Personal observations about the secretary's job are a bit premature as yet, and more likely to reflect impressions of the Association as a whole. Two of these are especially notable: the openhearted friendliness encountered on every side, and the willingness to work hard shown by so many of those elected and appointed to the many jobs and offices of the Association. I am proud, indeed, of the opportunity to serve with and to follow in the footsteps of so many fine people.

JAMES W. PENCE



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People, Products, Patter

• • • People

Bert Baker, head chemist at Maple Leaf Milling Co.'s Port Colborne (Ontario) mill, reelected to the Port Colborne Town Council.

Stanley Barton joins Procter & Gamble's exploratory division development department.

Rudolf C. Benson, technical consultant to Pillsbury Mills, Inc., overseas division, died March 4 of a heart attack at his home in Minneapolis. Mr. Benson joined Pillsbury in 1917 and later entered the quality control department. He was eventually appointed director of products control and in 1953 made technical director for the overseas division. Mr. Benson was a long time member of the AACC having joined in 1929.

Carl J. Buck joins chemical research and development department of Chas. Pfizer & Co. as an organic research chemist.

Robert R. Cooke joins development department, foods division, of Procter & Gamble.

John Creach moves west to take charge of the Quaker Oats Los Angeles mill laboratory.

Paul W. Hodler now manager of manufacturing, Frank G. Shattuck Co., New York.

Clifford M. Hollenbeck elected v-p in charge of research, Wisconsin Malting Co., Milwaukee; from director of research.

Vissert Hooft now v-p of Wallace & Tiernan, Inc. and continues as head of the plant at Buffalo, N.Y.

David P. Langlois appointed to newly created position of technical information scientist at A. E. Staley Mfg. Co., Decatur, Ill.

Vincent Lawson promoted to Pillsbury's Buffalo mill as assistant to **Chet Bald,** from Pillsbury's Sacramento mill.

Ronnie Light now chief chemist at Standard Mill laboratory.

G. (Nick) Moen retires April 1 from General Mills Products Control Department, after many years with this company and its predecessor, the Washburn-Crosby Co. He joined the latter in 1919 following service in a field bakery in France during World War I; in charge of test baking operations for GM since 1935. He has been an early and active AACC member, serving repeatedly on the Test Baking Committee and as chairman of Northwest Section.

Jerry Mruk now chief chemist at Russell-Miller Milling Co.'s Buffalo, N.Y., mill.

Millo Prochazka joins Maritime Milling Co., Buffalo, N.Y., as director of quality control; from products control of Birdsey Flour & Feed Mills, Macon, Ga.

• • • Products

To those concerned with bulk pneumatic conveying, ash handling, dust control and recovery, and air classifying, a new catalog is offered describing Fluor-Hartmann equipment, with plenty of photographs and diagrams. Through agreement with the German manufacturers, Fluor Products Co. is handling these systems and equipment in North America. Send your request for a copy of the catalog to them at Whittier, Calif.

• • •

"Nuclear Magnetic Resonance Supplies Fast Answers About Product Composition" is the title of a 9-page reprint of an article covering basic NMR theory, operation of a typical NMR apparatus, and research, applications of NMR analysis. Also, the use of NMR analysis in industry is discussed including simple measurement, analysis, and open- or closed-loop process control. Typical examples described in detail are measurement of moisture content in starch and control of a continuous-circulation dryer. For a copy (no charge) write Schlumberger Well Surveying Corp., Ridgefield, Conn.

• • •

With all elevator space filled with a bumper wheat crop, Cargill, Inc., constructed an emergency plastic-bag grain bin of Visqueen black polyethylene film to store nearly 600,000 bushels of oats near Omaha. Wooden strips and sandbags weigh down the cover and prevent wind whipping. The operation has provided good service for oats producers in Nebraska.

• • •

A new bimonthly magazine called "Pointers", dealing with equipment and systems for feed processing, is published by Sprout, Waldron & Co. Inc.; its major purpose, "to consolidate information about new methods and new equipment for feed and grain processing." The first issue includes a feature story on the use of pelleting, air handling, and inert gas storage at Schoeneck Farms; a discussion of the most suitable mill for grinding oat hulls; a catalog presentation of the Sprout-Waldron "FM" feed mixer; a technical discussion on the high fat pellet situation; and a brief item on a South American feed mill. Available on request to all those in the feed and grain processing industries; address the company at 130 Logan St., Muncy, Pa.

• • •

Morea® liquid livestock feed supplement is handled by mixer-distributors in various areas under license by Feed Service Corporation, Crete, Nebraska, through U. S. Industrial Chemicals Co. Local mixer-distributors blend liquid Morea premix concentrate with molasses and sell the finished product to farmers and feeders. Other

ingredients, include urea nitrogen, ethanol, phosphoric acid, and essential trace minerals. Rumen digestion is speeded up and improved, because ethanol acts as a hydrogen donor to assure more efficient use of nitrogen for building protein.

• • • Patter

H. Kohnstamm & Co., Inc., held the annual meeting of their Eastern and West Coast sales representatives at the Governor Clinton Hotel, New York, February 20-22. New products were introduced and their uses discussed by the company's color and flavor technical staff. Present were Louis J. Woolf, chairman of the board; Paul Kohnstamm, president; Arthur D. Vogel, v-p; Samuel Zuckerman, v-p; David Jorysch and Robert Cooney, asst. v-p's; William Lane, Howard Zimmer, V. N. Tinnes, Andrew J. Torter, Si Slovitt, Michael Dunne, William E. Olson, Joseph P. Torter, Louis Agre, Carroll D. Biddison, Jesse White, Herb Johnson, Robert S. Woolf, Jim McNellis, J. A. Holderreid, William J. Kelley, Harold Anderson, G. H. Sloane, and E. M. Moss.

• • •

The American Association of Feed Microscopists will hold its 1958 annual meeting in Ottawa, Canada, June 16-18. E. F. Budde, Quaker Oats Co., Barrington, Ill., is vice-president of the association.

• • •

Nebraska Bakery Production Club's first annual pre-Lenten cocktail party, dinner, and dance for members and wives was held on February 8 at the Ranch Bowl, Omaha. Sixty-five persons were present.

At a technical session on March 15, following noon luncheon at Hotel Castle in Omaha, Robert Dibble of Interstate Bakeries Corporation, Kansas City, Mo., spoke on "Production flow, bread and rolls," and Leslie F. Sheffield, chief of the Division of Wheat Development, Nebraska Wheat Commission, Lincoln, presented color slides on the International Trade Fair held in Cologne, Germany.

• • •

Manufacturing Chemists' Association, Inc., has released the text of an address by its president, Gen. John E. Hull, USA (Ret.), before the St. Louis Chamber of Commerce on February 25. Titled "The importance of scientific literacy," the discussion points out the dangers of vast scientific illiteracy on the part of the public because the public, not the scientists, will eventually determine how American science will progress.

Bread:

(Continued from page 79)

sirability of restoring such nutrient or nutrients to the dietary.

6. "The Board reaffirms its endorsement of the enrichment of flour, bread, degerminated corn meal, and corn grits, the nutritive improvement of whole grain corn meal and of white rice, and the addition of vitamin D to milk, of vitamin A to table fats, and of iodine to table salt."

If these principles were adhered to, the proponent of a "nutritionally improved" bread first would be required to demonstrate that increased intake of a specific nutrient or of a unique bread ingredient would be of benefit to the consumer. This would require that some bread-eating group has a demonstrable deficiency of some specific nutrient or nutrients, which deficiency could be overcome by loading it or them into bread.

The enrichment of bread has followed the principles cited above. First, deficiencies were ascertained. Then it was observed that they occurred in people who eat cereals. Therefore, cereals become the proper vehicle for the greater distribution of these nutrients. Thus, enrichment obtained the backing of those interested in public health and, for that reason, succeeded. Further change in nutrient content of bread is dependent also upon such support, and cannot succeed without it.

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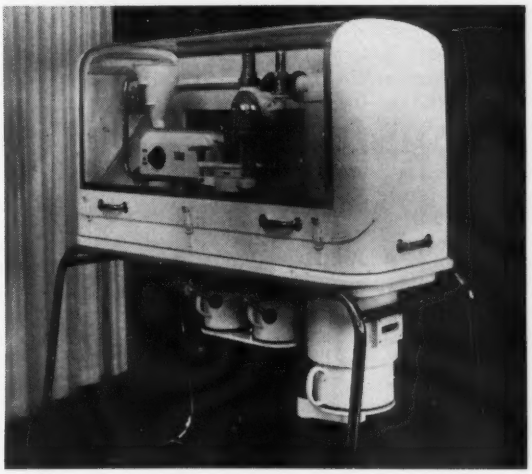

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LOCAL SECTIONS

Northwest Section will hold its final meeting of the current season at the Honeywell Research Center on March 28, 12:30 p.m. After a short business meeting and the election of officers, Van W. Bearinger, associate director of research for Honeywell, will describe the company's research activities and take the members on a guided tour of the laboratories.

• • •

Chesapeake Section held its monthly dinner meeting at Marty's Park Plaza in Baltimore on February 27, with about 30 members and guests attending. An excellent talk by William W. Goodrich, assistant general counsel of the Food and Drug Administration, on "Chemical additives and food" was followed by a spirited discussion.

On March 27, G. E. Hilbert, assistant administrator, Utilization Research and Development, USDA, will address the section at the Log Lodge, Beltsville, Md., on "Approaches toward the solution of the cereal surplus program through industrial utilization."

• • •

New York Section met on February 11 to hear AACC national president William B. Bradley discuss the question of evaluating the nutritive value of bread by feeding it to rats. Slides were shown from several nutrition studies in Germany, Great Britain, and the United States, establishing the importance of the role played by enriched bread in human nutrition. Dr. Bradley also reported on national Association affairs.

Present as members of the local New York Section were these past-presidents of the national Association: Charles N. Frey, Hugh Parker, R. C. Sherwood, Oscar Skovholt, and Bill Cathcart, as well as president-elect Clinton Brooke. Herman Sausselle, chairman of the St. Louis group, was a visitor.

On March 11 Mr. John Drake presented his views on a subject of vital interest to all global-thinking cereal chemists — "Cereals — the mystery food." Mr. Drake is a former Australian journalist, now an information liaison officer for the Food and Agriculture Organization of the United Nations; he has been with the FAO in Rome and has traveled extensively in Asia.

• • •

Canadian Prairie Section meets on March 18, jointly with the Manitoba Section of the Canadian Food Technologists. Following dinner in the cafeteria of the Grain Exchange Building, G. N. Irvine gives an illustrated talk: "Modern Japan — its food, customs, and people." The talk stems from Dr. Irvine's visit in Japan in April and May of last year, with A. W. Alcock of the Maple Leaf Milling Co., as a technical mission to study the cereal processing industries and related research.

• • •

Pacific Northwest Section reports that the Advisory Committee to the Western Wheat Quality Laboratory met December 17 in Spokane to review progress of the laboratory, with a view to aiding the coordination of other wheat improvement work. Quality evaluation charts were presented, on which the various new varieties were rated in order of suitability, alongside of the common commercial varieties, according to quality components.

Evaluation of micro samples relative to milling has developed to the stage where thousands of samples can be examined, the report continues, and the test is being used extensively by the laboratory. Evaluation of the small sample relative to flour quality has not yet developed to a similar stage, but methods to date appear to be practical on a limited scale. They are considerably faster than macro evaluation, although less accurate. Varietal and sample differences in flour particle size have become apparent which appear to be associated with baking performance.

Reports on the research studies under way show progress in further development and simplification of the dye-binding method for protein analysis of cereals; in the discovery of the constituents responsible for varietal differences in pastry flour quality; and in the interactions between the polysaccharides and proteins in flour on the addition of water.

Joe DeHaan, General Mills, Inc., Tacoma, who suffered a heart attack around the first of the year, is reported doing fine and resuming work on a part-time basis in February.

A milling of Itana wheat was made on March 14 at the Wenatchee mill.

• • •

Pioneer Section meets Friday and Saturday, March 21 and 22 at Lassen Hotel, Wichita, Kansas, opening with an informal gathering and committee meetings on Friday evening. A Saturday morning business session precedes the program: Kenneth R. Majors, Extension Grain Utilization Specialist, USDA, "Research on wheat products"; Charles Feldberg, Chas. Pfizer & Co., Inc., "Nutritional plus values for cereal products"—lysine; Harold Schuler, Pillsbury Mills, Minneapolis, "Maintaining a competitive and equitable salary program." After luncheon, presentation of check sample awards by George Schiller, Pillsbury Mills, Enid, Okla.

• • •

Niagara Frontier Section met on February 10 at the William Davis residence in Buffalo to meet and hear William B. Bradley, national AACC president. A severe blizzard necessitated cancellation of the formal dinner and meeting scheduled at Norton Hall, University of Buffalo. Twelve members and guests managed to reach the Davis residence for cocktails and hors d'oeuvres served by courtesy of the Sterwin Chemical Co. Dr. Bradley spoke informally to the group there, reviewing the shortcomings of some methods frequently used for evaluating the nutritional aspects of human foods and supplements, and acquainting the group with the general status of the Association.

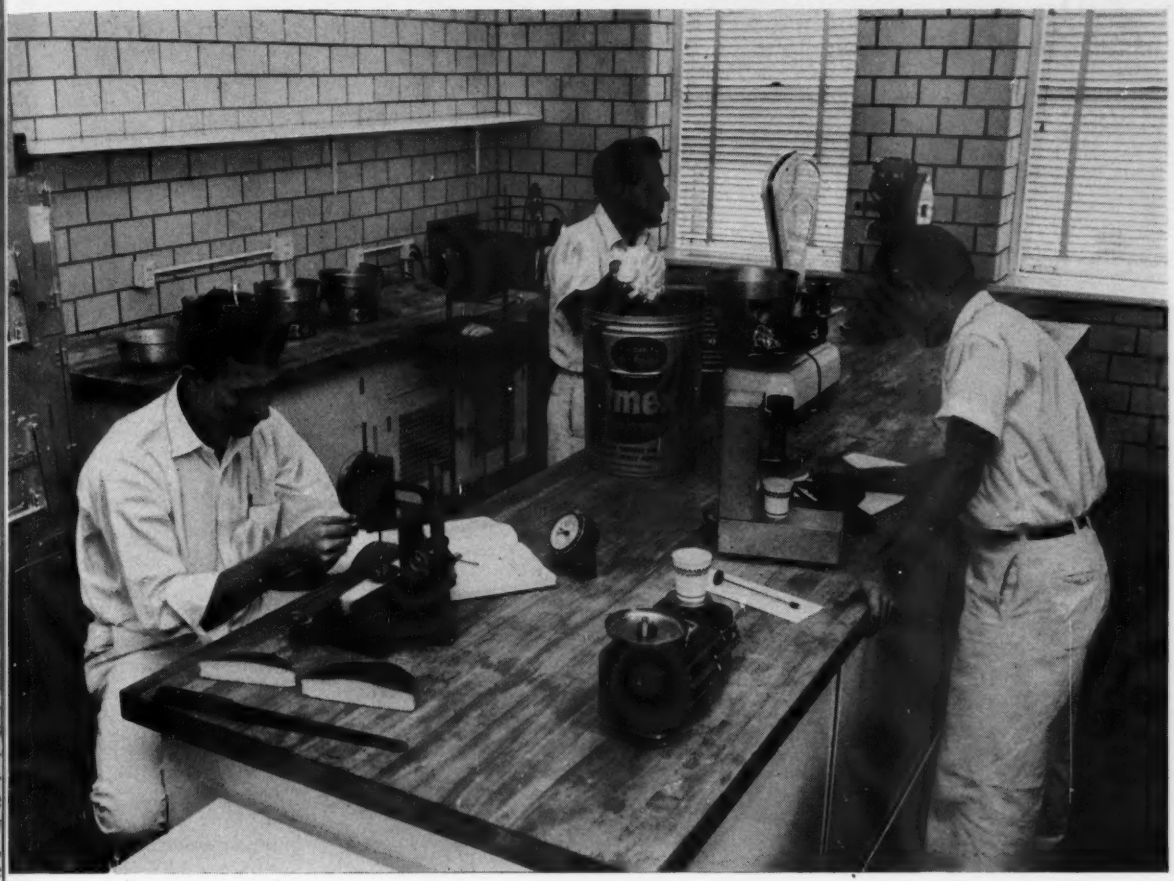
At the meeting on March 10, members heard L. A. Underkofler of Takamine Laboratories, Clifton, N. J., review "Production and application of microbial enzymes." The replacement or supplementation of old sources of enzyme systems in many branches of the cereal industry with precise enzymes of microbial origin is one of the most interesting recent developments in food technology.

No meeting in April because of the national meeting in Cincinnati.

A conducted tour of the huge new Sir Adam Beck Hydroelectric Power Station at Queenston Heights, Ontario, is scheduled for May 17 — a Saturday afternoon, to allow full family participation. More details later.

Mr. and Mrs. Stanton Hadley motored through the northwestern states and prairie provinces, visiting various International and Robin Hood mills and offices.

A corner of one of the famous Procter & Gamble laboratories at Ivorydale, Ohio. At P & G, product improvement goes hand in hand with the developments of science.



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Observations

The Doty's just returned from a wonderful trip to South America. Our daughter and her husband are located in Bogota, Columbia, so our trip to South America therefore was to visit them. They took their vacation while we were there and we had an opportunity to visit not only places close around Bogota, which is 8500 feet altitude, but also flew down to the low jungle country on the Magdalena river.

On our way home we stopped in Haiti. There we had the opportunity of visiting a beautiful and extremely modern flour mill called the Caribbean Mills. The management at Caribbean Mills took me for a tour through the the bakeries in Port-au-Prince. In my wildest imagination I never suspected that such primitive bakeries still existed. The native bakers, stripped to the waist, mix doughs in a trough by hand with sweat streaming into the doughs as they mix. The doughs then are put in a tub and covered with a flour sack for 8 to 12 hours, after which they are made up and allowed to proof about 2 hours before going to the oven. The grain of the finished loaf has openings about one-quarter of an inch in diameter. The texture was extremely firm and tough, but the bread has a wonderful flavor. The thought occurred to me that perhaps we are missing a bet by not enriching our doughs during the mixing operation as they do in Haiti. I would highly recommend that all chemists interested in sanitation make a visit to the bakeries in the Caribbean—particularly would I enjoy visiting these bakeries with some of our Food and Drug Officials.

Jim Doty

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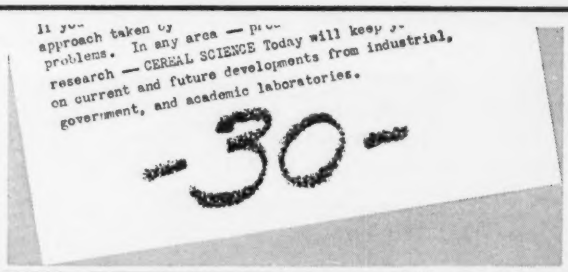
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-30-

Business Routine

During the past few weeks we have been reading with considerable interest a series of articles appearing in the weekly *Chemical and Engineering News*. The series concerns routine activities of the American Chemical Society and how they are carried out. We were interested because the AACC business office has much the same problems as the ACS although of less magnitude (about 80 times less). Few of us ever stop to realize the amount of work that accompanies the simplest of projects unless we have had a part in doing the work.

A good example of what appears to be a simple task is the yearly billing of members. About October 1 we receive dues notices from our printer that combine an invoice with an addressed return envelope, a convenience we hope for our members. Each invoice is run through the Addressograph so that it may be used in a window envelope, saving additional addressing and providing the business office with an accurate record of who is paying. Members may also use this opportunity to correct or make necessary changes in their mailing plate.

In order to eliminate individual addressing of membership receipt cards and thereby save time and labor costs, the cards are also addressed by machine at the same time the invoices are put through. These cards have been designed for use in a window envelope to again save time and labor.

Dues statements are mailed to all members via first class mail during the second week of October. By the end of December some 60-70% of the members have paid and their payment posted to permanent record cards and the ledger. We maintain a card for each member which gives his current address, date of election to membership, status, date of dues payment, business classification, and various other key references.

Every time a member changes his address, his type of work, etc. his record card is brought up-to-date. About 350-400 changes of this nature are made during the year. Of course cards must be typed for new members, proofread, and filed. About 50-100 new members are enrolled annually.

It may be of interest to our members to know that the headquarters office maintains its own set of Addressograph plates and associated equipment. This includes about 4000 plates for use by our publications. All envelopes carrying CEREAL CHEMISTRY or CEREAL SCIENCE TODAY are addressed in our office. Use of this plate list and equipment saves the Association money and gives faster service to members and subscribers on address changes.

Unlike the ASC, our headquarters doesn't have a "Member Business Service Department" a "Treasurer's Office", or an "Accounting Department" to take care of the various steps in processing a new member, receiving dues from an old member, or banking the receipts from the day's mail. Nor can we boast of a "Classification Department", a "Mailing List Department" or an "Admissions Department". However, the various functions performed by these different departments are carried out by our staff of one part time and two full time employees. Diversification is our watchword and all of us must be able to run an Addressograph as well as know how to post a member's dues.

In every operation there are complications and billing members is no exception. Often checks are received from companies paying dues of several employees but not giving their names. Many times we must decide which Johnson or Smith among several on our rolls is paying.

R.J.T.